LOCUMENT RESUME

ED 122 745 IR 003 335

AUTHOR	Logan, Timothy; And Others
TITLE	A User's View of BALLOTS; Numbers 4, 5, 6, and 7. The PO/OC Module; The ACC/NPO Modules (A Supplement to No. 4); The SO Module (A Supplement to Nos, 4 and 5); the OP Module (A Supplement to Nos. 4, 5, and 6).
INSTITUTION	Stanford Univ., Calif. BALLOTS Center.
PUB DATE	75
NOTE	82p.; For related documents see IR 003 333-335; Not available in hard copy due to marginal quality of original document
EDRS PRICE	MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	*Cataloging; Computer Programs; *Guides; Information Systems; Library Acquisition; *Library Automation; *Library Technical Processes; Manuals; *On Line Systems; Purchasing; Search Strategies; University Libraries
IDENTIFIERS	*BALLOTS; Bibliographic Automation Large Library Operations; Purchase Order and Original Cataloging; Stanford University

ABSTRACT

The "Purchase Order and Original Cataloging" (PO/OC) module is one of 11 units that make up the Bibliographic Automation of Large Library Operations Using a Time-sharing System (BALLOTS) used in the Stanford University Libraries. As part of this on-line, interactive system, the PO/OC module provides for the computerized production of purchase orders, dealer reports, search notices, catalog cards, spine labels, claim notices, and other forms necessary to complete cataloging functions. This text provides a detailed description of the tasks performed by PO/OC, and it provides a brief description of the other modules which make up the BALLOTS system. For further information please contact BALLOTS, Stnaford Center for Information Processing-Willow Trailer, Stanford University, Stanford, California 94305. (EMH)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED122745

Timothy Logan
Glee Harrah Cady
Eleanor Montague
Madeleine Stovel

A USER'S VIEW OF BALLOTS

Nos. 4, 5, 6, and 7

The PO/OC Module
The ACC/NPC Modules (A Supplement to No. 4)
The SO Module (A Supplement to Nos. 4 and 5)
The OP Module (A Supplement to Nos. 4, 5, and 6)

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

December 1973
June 1974
July 1974
September 1974

Library Computing Services (BALLOTS Project)
Stanford Center for Information Processing
Stanford University
Stanford, California

IR 003 335

Timothy Logan

Glee Harrah Cady

A USER'S VIEW OF BALLOTS

No. 4

The PO/OC Module

December 1973

BALLOTS Project
Stanford Center for Information Processing
Stanford University
Stanford, California

Individuals or groups reprinting any part of this work are requested to include full identification of the authors, title, and original publisher. The BALLOTS project would appreciate receiving a copy of any document in which this work is quoted.

ACKNOWLEDGMENTS

The research and development that this paper describes were carried out by several members of the Project BALLOTS staff. They are

Glee Cady,
Wayne Davison,
Timothy Logan,
Donn R. Martin,
Eleanor Montague,
Baxter Moyer,
Norman Roth, and
Madeleine Stovel.

The search routines and file service routines used in BALLOTS were developed by members of the SPIRES project (Stanford Public Information REtrieval System); the work of Richard Guertin, William Kiefer, and John Schroeder has been vital to the success of BALLOTS.

The metalanguage used in both SPIRES and BALLOTS to define the command language, a modified BNF (Backus-Naur Form), was developed by Thomas H. Martin.

Michael Hu, Manager of Engineering for Academic Computing Services, Stanford Center for Information Processing, and Richard Levitt, James Powell, and Craig Will, of the Academic Computing Services systems group, developed hardware and software to support the operation of the BALLOTS video display remote terminals.

OVERVIEW

In November 1972, the Stanford University Libraries began the daily operation of the first portion of their on-line library automation system. The system, BALLOTS (Bibliographic Automation of Large Library Operations using a Time-sharing System), is being developed and implemented on an IBM 360 model 67 computer at the academic computing branch of the Stanford Center for Information Processing (SCIP). This first portion of BALLOTS, called the MARC module, utilized an on-line file of bibliographic records from the Library of Congress's MARC (MAchine-Readable Cataloging) system.

In April 1973, the second portion of the BALLOTS system was implemented. The second set of services, called the In Process File (IPF) module, added a second on-line file. The In Process File contains bibliographic, acquisition, and cataloging information for books being ordered, received, and cataloged. Both the MARC and the IPF files can be searched by author, title word, and record identification number.

In June 1973, the third portion of the BALLOTS system was implemented. The third set of services, called the Catalog Data File (CDF) module, added two new on-line files. The Catalog Data File contains bibliographic and copy holdings information for all titles cataloged through the automated system since April 1973 (when the In Process File was implemented). The Reference File (REF) contains "see", "see also", and explanatory references for headings indexed in the Catalog Data File. Both of these new files can be searched by record identification number, author, title word, and subject. The Catalog Data File can also be searched by call number and LC card number.

In November 1973, the Stanford University Libraries began daily operation of the fourth portion of the system, the Purchase Order and Original Cataloging (PO/OC) module. This module provides for the input of non-MARC cataloging information. The PO/OC module provides for full utilization of MARC records as well as of original cataloging information.

Order Division searchers search the Reference File (BREF), the Catalog Data File (BCDF), and then the In Process File (BIPF) to determine if an acquisition request is for an added copy. If no record is found, the system will automatically search the BALLOTS file of MARC records (BMRC). If the searcher finds a BMRC record for a title to be ordered, he adds to it acquisition data such as vendor, requester(s), and Stanford budget account code. This data is input using a programmed input format displayed on the video terminal. If no MARC record is found, the searcher inputs whatever bibliographic data is available (e.g. book catalog copy, dealer catalog data, etc.). This activity creates a new BIPF record, and an overnight batch program prints a purchase order, a dealer report slip, and a vendor invoice. Orders for added copies or added volumes can be added to records already present in the BIPF or BCDF.

The Order Division can claim or cancel whole or partial orders in the automated system. Claim letters and cancellation notices are produced overnight as a result of data keyed into In Process File records. In all processing activities, an on-line editing program immediately verifies data input by a user and redisplays faulty data flagged with error codes.

When received, items can be checked in so that their receipt is recorded in the BIPF records. Both partial and complete receipt of orders can be recorded. Catalog data slips (technical processing slips containing both bibliographic and acquisitions data) and requester notices are printed overnight.

The Distribution and Searching Unit of the Catalog Department uses the automated system to route items to the appropriate processing station.

To catalog a book, a member of the Catalog Department makes any necessary changes to the data on-line, verifies the shelving location, and adds the copy number. The source of the bibliographic information is indicated whenever it is displayed. If the source was the BMRC file, the cataloger knows the bibliographic description for the item came from MARC. If the source was NUC, the cataloger knows the source was National Union Catalog contributed copy. When an item is cataloged, a BCDP entry containing both a bibliographic description and a full holdings record is created for it.

The Catalog Department may catalog books that were not ordered through the automated system (e.g. gifts and exchanges) by using a BMRC record, inputting contributed catalog data, or performing original cataloging. Users input the bibliographic information and then proceed to assign a copy number to the book as they would to one already present in one of the BALLOTS files.

When a cataloging or reference input activity has been completed, the BALLOTS batch programs produce a set of catalog cards. All the day's catalog cards are sorted and printed overnight in the proper filing sequence. Spine labels are printed by the BALLOTS system each morning in the library at an IBM 2741 typewriter terminal.

After a book has been cataloged, the Catalog Department can modify the bibliographic and holdings data and request new catalog cards. Reclassification, recataloging, transfers, discards, and other catalog maintenance changes may also be done.

The Catalog Department can also input reference records into the BPEF. These references may be of three types: (1) "see", (2) "see also", and (3) explanatory/history references.

If a MARC record is not found for ordering or cataloging, the library may institute a weekly search in the BMRC file for that title. The system checks this standing search request (SSR) against the BMRC file each week after new MARC records have been added. If a match is found, the search request and the BMRC record are printed out as a "matched SSR notice" and delivered to the Library.

CONTENTS

INTRODUCTION 1

THE BALLOTS FILES AND INDEXES 3

The BALLOTS MARC File - BMRC 3

The BALLOTS In Process File - BIPF 5

The BALLOTS Catalog Data File - BCDF 6

The BALLOTS Reference File - BREF 9

The BALLOTS Standing Search Request File - BSSR 10

SEARCHING THE BALLOTS FILES 10

THE ORDERING FUNCTION 12

THE PROGRAMMABLE CRT TERMINAL AND BALLOTS SOFTWARE CAPABILITIES 19

BALLOTS CRT SCREEN FORMATTING 20

SPECIFIC FORMATS 21

PROTOCOLS AND COMMANDS 24

OTHER BALLOTS FUNCTIONS 28

The Claim/Cancel Function 28

The Receiving Function 30

The Distribution Function 34

The Cataloging Function 38

The Reference Function 43

The Catalog Maintenance Function 45

The Scratch Function 48

HARDWARE CONFIGURATION 48

FULL SYSTEM SUMMARY 51

CLAN (CALIFORNIA LIBRARY AUTOMATION NETWORK) 54

CONCLUSION 55

ADDITIONAL REFERENCES 56

FIGURES

1. The Sanders PDS 804 Programmable CRT Terminal 2
2. A Search Request on the SI1 Format 11
3. Book Request 11
4. A Partial Bibliographic Display on the PR1 Format 11
5. Search Results Displayed on the SI2 Format 13
6. Iterative Searching on the SI2 Format 13
7. Filling in Ordering Data on the OR1 Format 14
8. Corrected Order Input Format 14
9. Blank Bibliographic Input Format 14
10. National Union Catalog Contributed Copy 17
11. Entering NUC Information on a BI1 Format 17
12. Entering NUC Information on a BI2 Format 17
13. Order Input Format Accepted, Return to General System Format 18
14. Purchase Order 18
15. Order Function Protocol Chart for PO/OC Module 26
16. Partial Bibliographic and Partial Acquisition Information Displayed on the PR1 Format 29
17. Use of the Acquisition Matrix (RX1) Format in Claiming and Canceling 29
18. Cancellation Notice 31
19. Two-Part Claim Letter 31
20. Full Acquisition Display Format 32
21. BIPF Record Update on the OR1 Format in Receiving 32
22. Requester Notice 32
23. Use of the RX1 Format in Receiving 33

24. Catalog Data Slip 35
25. Title II File Slip 37
26. Catalog Search Request Displayed on the BF1 format 40
27. Use of the Bibliographic Input (BI1) Format 40
28. Use of the Additional Bibliographic Input (BI2) Format . . . 41
29. Cataloging on the Holdings Input (HH2) Format 41
30. Main Entry Catalog Card 44
31. Shelf List Catalog Card 44
32. Spine Labels 44
33. Blank Reference Input Format 46
34. Filled-in RI1 Format 46
35. Reference Catalog Cards 47
36. Full Reference Display Format 47
37. Catalog Maintenance on the Holdings Update (HU1) Format . . 49
38. The Final Results of Processing, Displayed on the PR1 Format 49
39. BALLOTS Hardware Configuration 50
40. BALLOTS System, Features by Module 52

INTRODUCTION

BALLOTS* is an on-line interactive library automation system that supports the acquisition and cataloging operations of the Stanford University Libraries. The BALLOTS system is being implemented in a series of 11 cumulative sets of services, or "modules." This paper describes the fourth of these, the "Purchase Order and Original Cataloging (PO/OC) module." (The other scheduled BALLOTS modules are described briefly at the end of this paper, in the order in which they will be implemented.) The PO/OC module was implemented in November 1973 and now operates daily in the Stanford Main Library. As those who are familiar with A USER'S VIEW OF BALLOTS, numbers 1, 2, and 3, will see, the operational PO/OC module incorporates the capabilities of the previous modules and adds to them.

The PO/OC module provides for the computerized production of purchase orders, dealer reports, matched standing search notices, catalog cards, spine labels, claim notices, catalog data slips, invoice alert slips, cancellation notices, requester notices, Cancel File slips, Title II File slips, NPAC notices, and management reports. Four on-line files, each having several indexes, are maintained as part of the system.

The BALLOTS system uses programmable CRT (cathode ray tube) terminals in the library that are connected to a Stanford Center for Information Processing (SCIP) IBM 360 model 67 computer, approximately one mile away. This computer also supports the faculty and student academic and research computing. About 2,000 computing jobs, in addition to BALLOTS, are run on this computer each day.

The Sanders 804 CRT terminal used for BALLOTS is shown in Figure 1. It consists of a keyboard, a cathode ray tube capable of displaying 1,920 characters at a time (in 24 eighty-character lines), and a 4,096-byte programmable microprocessor. The CRT terminal could be called a window into the BALLOTS system; through it the library communicates with the system. Printed outputs, like the purchase orders and catalog cards, are produced overnight as a result of the daily on-line activity at the terminal.

One way of describing BALLOTS is to explain how it is used in normal day-to-day library operations. The BALLOTS files will be described and several typical book processing cycles will be traced in the examples that follow.

---

*Bibliographic Automation of Large Library Operations using a Time-sharing System. A large part of BALLOTS development up to the development of the first module was funded by a grant from the U. S. Office of Education, Department of Health, Education, and Welfare. The development of the second through the eleventh modules is supported by a grant jointly funded by the National Endowment for the Humanities and the Council on Library Resources. Any opinions, findings, or conclusions stated in this paper do not necessarily represent the views of the Endowment or the Council.

Figure 1. The Sanders PDS 804 Programmable CRT Terminal

THE BALLOTS FILES AND INDEXES

The PO/OC module of the BALLOTS system utilizes four on-line files. These files are: (1) BMRC - the BALLOTS MARC file, (2) BIPF - the BALLOTS In Process File, (3) BCDF - the BALLOTS Catalog Data File, and (4) BREF - the BALLOTS Reference File. The BMRC file, BIPF, and BCDF all contain bibliographic descriptions for titles. The BREF contains only reference information for records in the BCDF. A fifth file, the BSSR (BALLOTS Standing Search Request) file, is also part of the BALLOTS system. The BSSR file is not an on-line file, and it contains only search requests awaiting incoming Library of Congress MARC tapes. The BSSR file's use is restricted to performing searches against the BMRC file.

Here, each file is considered as a separate and distinct file. In reality, the BIPF, BCDF, and BREF records are contained in the same file, even though to the user these records appear to reside in separate files. There is one set of index files that serves the BMRC file as well as the BIPF/BCDF/BREF file(s).

The BALLOTS MARC File - BMRC

Once a week the BMRC file is updated with records received from the Library of Congress on magnetic tape. These tapes represent English- and French-language monographs currently cataloged by LC, including Cataloging in Publication (CIP) records. LC MARC tapes are converted into BALLOTS format and incorporated into the BMRC file and its indexes. This process consists of converting MARC-tagged information elements into BALLOTS data elements. Some MARC fields are manipulated (i.e. broken apart, combined, etc.), and a few are disregarded during conversion.

Each MARC record is tested to see if it falls within the scope of the Stanford University Libraries' collection criteria. (Juvenile records and records in certain subject areas, such as LC classifications CS, CR, V, R, etc., are not converted to the BMRC file.) When the BALLOTS system begins to support network operations (see "ILAN" below), excluded subject areas will be reviewed for inclusion in the BMRC file.

The BMRC file contains only bibliographic title descriptions converted from MARC tapes to BALLOTS format. Records may be copied from the BMRC file for inclusion in the BIPF or BCDF, and they may be altered in the BIPF or BCDF, but they are never changed in the BMRC file. This means that the BMRC file always contains "pure" MARC record material, unmodified by Stanford. If a revised MARC record arrives for a record present in the BMRC file, the first record is deleted and replaced by the revised version. This automatic replacement of MARC bibliographic data occurs only in the BMRC file.

There are four indexes to the BMRC file that can be used alone or in combination to search the file. Each index has one or more names

that can be used in search requests. The indexes for the BMRC file are:

1. Personal Name Index. The valid names for this index are PN, A, or AUTHOR. If values exist in a BMRC record for any of the following BALLOTS data elements, the personal name portions of those values (i.e., excluding dates and relators like joint author or title) are indexed in the PN index. The five data elements indexed in the PN index are:

1EPN (Main Entry - Personal Name)
OAPN (Other Added Entry - Personal Name)
SNPN (Series Note - Personal Name)
SEPN (Series Entry - Personal Name)
OAPT (Other Added Entry - Personal Name - Title)
(Only the personal name portion of the OAPT data element is indexed in the PN index)

An author's name in the PN index can be searched for in a variety of forms. Figure 2 shows a typical search request using one form of the author's name ("find pn J. M. White"). The following variations on this name, or any combination of them, would also be accepted as valid search terms and would locate the same record:

WHITE, J.E.M.	(initials)
White, M.	(some initials omitted)
White, J E M	(initials without periods)
white, jon ewbank manchip	(capitalization ignored)
J.E.M. White	(surname first or last)
Manchip White, J.E.	(surname first or embedded)
White, Jo Ewb Man	(implicit truncation of forenames)
Whi#, J.E.M.	(explicit truncation of surname through use of pound sign)

The BALLOTS system makes these extensive efforts to recognize different versions of a personal name because the exact form of an author's name is not always known. This helps to insure success in on-line search efforts.

2. Corporate/Conference Name Index. The one valid name for this index is CN. The CN index is a "word" index. In a word index, every significant word in the value of an indexed data element is indexed. Words that are not considered significant are not indexed. These are called "exclusion words." Some CN index exclusion words are: a, ad hoc, and, corp., meeting, institute, state, working. Words are added to the exclusion word list if they are so numerous as to result in inordinate numbers of index entries. Exclusion words may be included in a search request, but they are ignored by the BALLOTS search programs.

The ten BALLOTS data elements indexed in the CN index are:

MECA (Main Entry - Corporate Author)
MECF (Main Entry - Conference Name)
OACA (Other Added Entry - Corporate Author)
OACF (Other Added Entry - Conference Name)
SNCA (Series Notes - Corporate Author)
SNCF (Series Notes - Conference Name)
SECA (Series Entry - Corporate Author)
SECF (Series Entry - Conference Name)
OAAT (Other Added Entry - Corporate-Name - Title)
OAFT (Other Added Entry - Conference-Name - Title)
(Only the name portion of the OAAT and OAFT data elements is indexed in the CN index)

3. Title Word Index. The valid names for this index are T and TITLE. The T index is a "word" index like the CN index. The seven BALLOTS data elements indexed in the T index are:

TST (Title Statement - Short Title)
MET (Main Entry - Title)
MEUT (Main Entry - Uniform Title)
OATA (Other Added Entry - Added Title)
SNST (Series Note - Series Title)
SEST (Series Entry - Series Title)
OAUT (Other Added Entry - Uniform Title)

Of the BALLOTS data elements OAFT, OAAT, and OAPT, only the words in the title portion are indexed in the title index. SNST is indexed only when it is traced in the same form in the record. Some typical exclusion words in the T index are: a, about, addresses, atlas, autobiography, basic, casebook.

4. Library of Congress Card Number Index. The valid names for this index are CRD and CARD. The one BALLOTS data element indexed in this index is CRD (LC card number), and only the numeric portion of CRD (excluding revision, prefix, and suffix notations) is indexed. If a card number is known, this is an efficient way to search, since every LC card number in the CRD index points to a single BMRC file record.

The BALLOTS In Process File - BIPF

The BIPF contains bibliographic and acquisition information for items on order or in process. If a title is ordered from a record found in the BMRC file, the BIPF entry for that book will contain a copy of the BMRC file entry (either unmodified from BMRC or modified at time of order by the Acquisition Department) and the acquisition information input at time of order. This order data is the vendor name, special instructions to the vendor, price, requester(s), number of items on order, etc. If a record is not found in the BMRC file for the title to be ordered, and the title is not an added copy to a book already in the system (i.e. a file entry for the title does not exist

in the BIPF or BCDF), then the Acquisition Department enters the most reliable bibliographic description for the item they can find. When the bibliographic description of an item is input, its source is indicated for later use in cataloging.

If the book ordered is an added copy to a title already in the BCDF, the BCDF record is used to order the added copy. The Order Division adds acquisition data for the added copy and a BIPF record is created. The processing status (PCCD) and the acquisition status (ACCD) data elements in the BIPF record clearly indicate the location of each item or items in the stream of technical processing activities.

When all the technical processing for a title in the BIPF is completed (i.e. the items on order are cataloged or the order canceled) the BIPF entry is deleted from the system.

The BIPF has five indexes that can be used alone or in combination to search the file. Four of these indexes are the same as those for the BMRC file, and function in exactly the same manner for the BIPF as for the BMRC file. The indexes for the BIPF are:

1. Personal Name Index
2. Corporate/Conference Name Index
3. Title Word Index (In addition to the data elements indexed in the title word index to the BRMC file, the data element TSUT--Title Statement - Uniform Title--is indexed)
4. Library of Congress Card Number Index

5. The BALLOTS Identification Number Index. This index has only one valid name: ID. Every bibliographic record (discrete title) in the BIPF has one ID number. Each ID number is unique and is added to the record when the BIPF entry is created at time of order. Like the CRD index, ID is an efficient search index, since "find <ID number>" will retrieve only one bibliographic record. If more than one acquisition subrecord has been added to the bibliographic description of an item (i.e., more than one purchase order is outstanding against the record) the user may, if he wishes, retrieve only the acquisition subrecord he desires by specifying the purchase order sequence number when performing the ID search. This is called an IDX search (IDX is the ID number plus the X--purchase order sequence--number).

The BALLOTS Catalog Data File - BCDF

The BCDF contains complete bibliographic descriptions for items cataloged and holdings information (i.e. the copy number and shelving location for each copy of an item). The BCDF record is created at the time the book is cataloged through the automated system. The bibliographic descriptions of items cataloged may come from various sources, e.g., MARC records (stored in the BMRC file), LC or NUC book catalog copy, Title II cards, LC proof slips, or original cataloging copy. All bibliographic descriptions except MARC copy are keyed into the system by the user, either at the time of ordering or at the time

of cataloging. These records are reviewed during cataloging before the BCDF record is created, and are upgraded or modified as necessary to conform to Stanford University Libraries' cataloging conventions.

The BCDF has the identical indexing scheme shared by the BMRC file and the BIPF (the indexes PN, CA, T, CRD, and ID) plus two other valid indexes: subject and call number. Thus, the seven indexes for BCDF are:

1. Personal Name Index (besides the data elements described for the BMRC file, the data elements SAPN--Subject Added Entry - Personal Name--and SAPT--Subject Added Entries - Personal Name - Title--are indexed for the BCDF)
2. Corporate/Conference Name Index (besides the data elements described for the BMRC file, the data elements SACA--Subject Added Entry - Corporate Name, SAAT--Subject Added Entries - Corporate Name - Title, SACF--Subject Added Entry - Conference Name, and SAPT--Subject Added Entries - Conference Name - Title--are indexed for the BCDF)
3. Title Word Index (besides the data elements described for the BMRC file, the data elements SAUT--Subject Added Entry - Uniform Title, SAPT--Subject Added Entries - Personal Name - Title, SAPT, and SAAT are indexed for the BCDF)
4. Library of Congress Card Number Index
5. BALLOTS Identification Number Index
6. Subject Index
7. Call Number Index

6. Subject Index. The valid names for the subject index are SUBJECT, SUBJ, or S. Only topical and geographic subject headings are included in this index, which exists only for bibliographic entries present in the BCDF. Subject personal names are available through the PN index. Subject corporate/conference names are available through the CN index. The only BALLOTS data element indexed in S is SASU (Subject Added Entry - Subject Heading). There are no exclusion words for the S index. The subject index is not a word index; the whole subject heading is treated as a single index term.

A subject heading search can be made as specific or as general as desired by the user. For example, the following subject searches have the effects noted.

fin S APT	Retrieves records with the heading "Art" alone.
fin S Women#	Retrieves records with a subject heading that begins with the character string "women", followed by anything else. For example, this request would retrieve "Women's writings,

	Chinese", "Women in the United States - Addresses, essays, lectures", "Women in art", "Women's liberation movement", "Women in Great Britain - History".
fin S Women #	Retrieves records with subject headings that begin with "Women", followed by something else. Would not retrieve "Women" alone as a subject heading.
fin S Women# history	Retrieves records with subject headings that begin with "Women", followed at any point in the rest of the heading by the character string "history". For example, this request would retrieve "Women in Great Britain - History", or "Women in Greece - History".
fin S Women# his	This request has the same effect outlined for the last type of search request. (Note that the truncation symbol within the request causes the system to assume an implicit truncation of the character string following.)
fin S wom# his	Retrieves, for example, "Women in Great Britain - History", "Woman - History and condition of women", "Woman - History and condition of women - Addresses, essays, lectures".
fin S women - #	Retrieves, for example, "Women - History and condition of women". It would not retrieve "Women in Great Britain - History".
fin S wom# - history	Retrieves "Women in Great Britain - History and condition of women". It would not retrieve "Women in history".
fin S Modern Art	This would not retrieve "Art, Modern". A subject "see" reference record would be required in this case.
fin S wom#bibliography	Retrieves "Women - Movement - Bibliography" and "Women - Movement - Biobibliography".

fin S wom# biblio-graphy	Retrieves only the first example just given.

7. Call Number Index. The valid name for the call number is CAL. The CAL index is valid only for records in the BCDF. The only data element indexed is the BALLOTS data element CAL. The CAL index may be searched as follows:

fin CAL N5#	Retrieves, for example, "N5630.H64", "N5630.D58 1973", and "N5494.C63.L56".
fin CAL HQ1426#	Retrieves "HQ1426.G66" and "HQ1426. H99 1973".
fin CAL Z5956.A7.G46	Retrieves call number "Z5956.A7.G46".

The BALLOTS Reference File - BREF

The BREF file contains all the references input into the BALLOTS system. These records are of three basic types: (1) "see" references, (2) "see also" references, and (3) explanatory/history references. The indexes for the BREF file are similar to those found in the other BALLOTS files, with the notable exception that different BALLOTS data elements are used in the creation of these indexes. The BREF indexes and the BALLOTS data elements they contain are:

1. Personal Name Index. The valid names for this index are: PN, A, and AUTHOR. The data element indexed in the PN index is RFPN (Reference From - Personal Name).

2. Corporate/Conference Name Index. The valid name for this index is CN. The data elements indexed are:

RFCA (Reference From - Corporate Name)
RFCF (Reference From - Conference Name)

The exclusion words for this index are identical to the CN index exclusion words for the BMRC file, BIPF, and BCDF.

3. Title Word Index. The valid names for this index are T and TITLE. The data element indexed is RFT (Reference From - Title). The exclusion words for this index are identical to the exclusion words for the T indexes of the BMRC file, BIPF, and BCDF.

4. Subject Index. The valid names for this index are SUBJECT, SUBJ, and S. The data element indexed is RFSU (Reference From - Subject Heading). There are no exclusion words for this index.

5. BALLOTS Identification Number Index. The valid name for this index is ID. Every record in the BREF file has a unique ID number, assigned automatically when the record is first input.

The BALLOTS Standing Search Request File - BSSR

BALLOTS supports one other file, the standing search request file (BSSR). This is not an on-line file. The library may, using this file, institute an automatic weekly search of the BMRC file for entries expected to appear in a future weekly LC MARC tape. These automatic searches of the BMRC file are of two kinds: (1) those that are kept and repeated for two months (or until a result is obtained) and (2) those that are kept and repeated for eight months.

With this file, the library has the option of delaying original cataloging until an expected MARC record arrives at Stanford and is added to the BMRC file. When such a record arrives, the user who created the BSSR file entry (standing search request) is notified that a record has been found that matches his or her search request. Since 95 percent of all BSSR file matches with new BMRC records are correct, the BSSR record is removed automatically from the BSSR file once it has been matched. If the BMRC record found in this way proves to be the one desired, the book is processed using the BMRC file entry. If the record proves not to be the one desired, the BSSR file entry is re-entered in the file, and the weekly search of the BMRC file continues until either the desired record is located or the time limitation of two or eight months is reached. When records are purged by the system because the search time limit has been exceeded, a printed slip recording this action is produced to notify the person who created the standing search request.

SEARCHING THE BALLOTS FILES

A typical Stanford library book processing cycle begins when the Acquisition Department receives a request from a faculty member, student, or staff member that a particular book be added to the collection. A sample book request is shown in Figure 3. On receiving the book request, a library staff member keys in a search request for that particular book at the CRT terminal keyboard. To do this, he or she uses a system-provided input format displayed on the screen. The search request, shown underlined in the format in Figure 2, is displayed as it is keyed. (In the following figures, all the data supplied by the terminal user is shown underlined; all the data supplied by the computer is shown without emphasis.) The user in this example chose to search ("find" or "fin") by a personal name ("pn"), and because he was unsure of the spelling of the author's name ("Jon" or "John"?), typed "J." instead. The user chose two words from the title. Because he was unsure of the spelling of "Cortes", he truncated the word to "Corte#", which will locate a record for any title word beginning with "Corte".

Responding to this request, the system (in the order function--see also "OTHER BALLOTS FUNCTIONS" below) searches sequentially the on-line Reference File, Catalog Data File, In Process File, and BMRC file indexes and returns the number of records found that match the search request. If a record or records are found in a file that match the

Figure 2. A Search Request on the SII Format

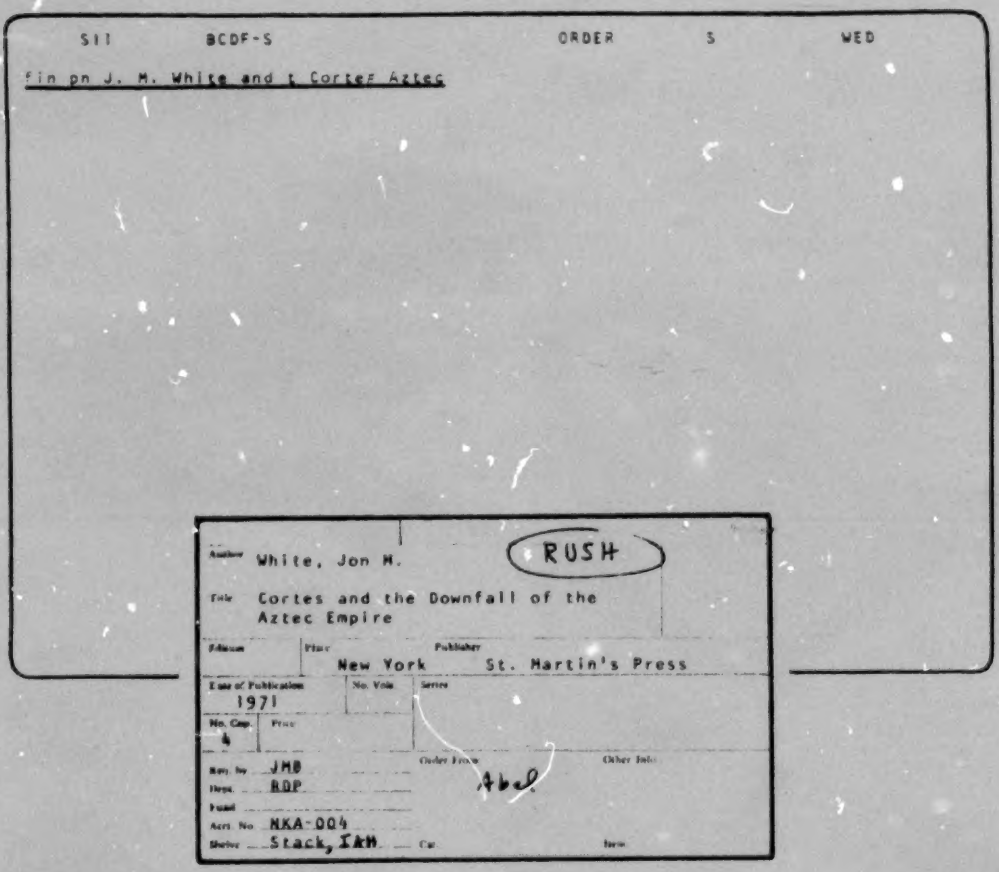


Figure 3. Book Request

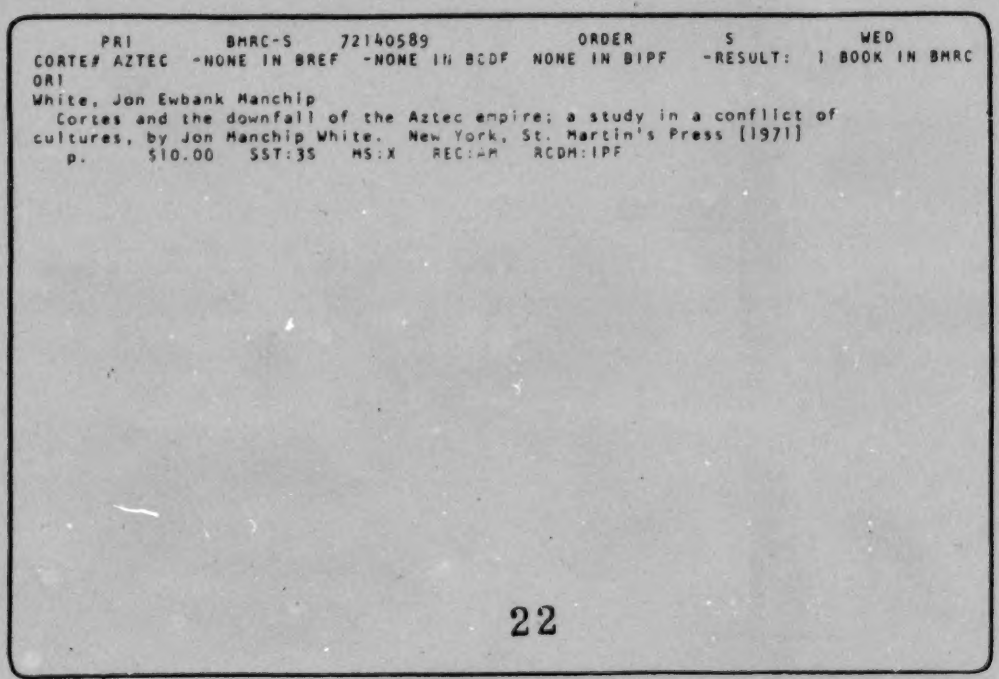

PRI BMRC-S 72140589 ORDER S WED
CORTES AZTEC -NONE IN BREF -NONE IN BCDF NONE IN BIPF -RESULT: 1 BOOK IN BMRC
ORI
White, Jon Ewbank Manchip
Cortes and the downfall of the Aztec empire; a study in a conflict of cultures, by Jon Manchip White. New York, St. Martin's Press [1971]
p. $10.00 SST:3S MS:X REC:AM RCDM:IPF

Figure 4. A Partial Bibliographic Display on the PRI Format

search, the search stops in that file. Either the single record found is displayed, or, if more than one is found, the user is informed of the number of records matched. In the case of several matches, the user issues the command "display" and examines each record individually. In the order function, the default display of data contains the main entry, title, pagination, publisher, date, series notes, acquisition data, and holdings data. If none of the records found correctly matches the title being searched, the searcher issues the command "resume" (see below, under "COMMANDS AND PROTOCOLS"), and the system goes on to search the next file in sequence. If the initial search yields zero results, the system automatically goes on to search the next file. The files to be searched and their sequence is determined by the technical processing function performed. Figure 4 shows a search result displayed in a case where no records were found in the BREF, BCDF, or BIPF.

If the search in Figure 2 had been entered as simply "fin pn J. M. White", the search might have produced more than one result, because more than one record in the data base fulfilled the search criteria. In this case--see Figure 5--the results are displayed as a numerical total of the number of records found, rather than the first of these records being displayed in its entirety. Figure 5 shows no records found in the BREF, BCDF, or BIPF, and five records found in the BMRC file that meet the search criteria. The user now has the choice of asking for each of the bibliographic records to be displayed in turn, or of keying additional search criteria that, when added to the previous search request, would reduce the number of records found. This second option is shown in Figure 6. Such iterative searching would produce the same result that was displayed in Figure 4. Figures 5 and 6 illustrate (very simply) the interactive searching capabilities of the system.

THE ORDERING FUNCTION

The user searches the Reference File (BREF), the Catalog Data File (BCDF), the In Process File (BIPF), and the BALLOTS MARC (BMRC) file in sequence. If a record is found that matches the request, the user can proceed with ordering. Books ordered from the BCDF or BIPF will be added copies to books either on order, being processed, or already cataloged. Books ordered from the BMRC file will be books that are new to the Stanford University Libraries or to the automated system.

Ordering a title for a record already present in the system (i.e. a BMRC file, BIPF, or BCDF entry) is accomplished as follows. If the search described in the previous section produced the desired record, and the library decides to order the book, the terminal user requests the order input (OR1) format for this bibliographic record. This is shown in Figure 7. The user fills in the format with the appropriate information: vendor data, accounting data, and enough additional information to produce a purchase order. In Figure 7, the values in the unemphasized fields were supplied by the system as default data: "PO" (purchase order) for the method of procurement (PRO); "01" for the

```
S12          BMRC-S                    ORDER          S          WED
J. M. WHITE  -NONE IN BREF  -NONE IN BCDF  -NONE IN BIPF  -RESULT:  5 BOOKS IN BMRC
```

Figure 5. Search Results Displayed on the S12 Format

```
S12          BMRC-S                    ORDER          S          WED
J. M. WHITE  -NONE IN BREF  -NONE IN BCDF  -NONE IN BIPF  -RESULT:  5 BOOKS IN BMRC
and t Cortes and Aztec
```

Figure 6. Iterative Searching on the S12 Format

Figure 7. Filling in Ordering Data on the ORI Format

```
ORI-O      BMRC-S     72-140589          ORDER        S          WED

ENT
    PRO PO              ADD 01              LLT
      X                 DAN                  PO
    SNI 2                SO                  SI WED
    MDX 4
     PR $40.00
    BAC NKA004          SHE
      R- 1 EMG
    RSD
    RCS
      V- 1 Able
    VSD
    VCS
    VSP RUSH, DO NOT SEND PAPERBACK EDITION
    VCT
    CAT
    ACQ MEx
      N-
    MSD
    MCS
```

Figure 8. Corrected Order Input Format

```
      ORI-O      BMRC-S     72-140589          ORDER        S          WED

ENT
04  BAC NKA006       05  SHE STK
      R- 1 EMG
    RSD
    RCS
04    V- 1 Abel
    VSD
    VCS
    VSP Rush, do not send paperback edition
    VCT
    CAT
    ACQ MEy
      N-
    MSD
    MCS
```

```
      BII-O      BIPF-S                          ORDER        S          FCI

BI2
     MF-
    TSUT
     TST
    TSSP
    TSRT
      FD
      DP
       D                                                          I
      PO                                                        CP
     ILL                                                       SST
      SZ                                                       REC
     LPP
    TSTI          NUC                    CRD                 CRDS
    ISBN                                                       MS
      IC
     ICA
      PC                                                       QPC
     SUP
     PUX
     PIP
```


Figure 9. Blank Bibliographic Input Format

address code (ADD) (this code stands for the Stanford University Libraries Order Division); "2" for the special notification indicator (SNI) (this code indicates that a notice is to be sent to a requester when the material is received); and "WED" for the searcher's initials (SI). The system also supplied a default request for one copy in the material description (MDX) field, but the user has changed this to four copies. The unit price, if present in the record, is supplied by the system, and may be altered by the user. In the vendor special instruction field (VSP), the user has indicated the need for rush processing by the vendor as well as an admonition not to send a paperbound edition. In the notes to cataloging field (CAT), the user has indicated that the main entry is established in the Stanford Catalog.

Many of the items on this format are coded, both in order to save space and because the day-to-day use of the order format involves a considerable amount of repeated data. For instance, instead of putting in a specific vendor's name and address, the user enters a vendor I.D.; the system uses this I.D. to look up the vendor's name and address in an internal file.

In the example shown in Figure 7, there are three errors in the input. When the user has decided that the ordering information is complete and has transmitted this information to the computer (by depressing the "SEND" button on the terminal keyboard), BALLOTS programs perform on-line editing of the data elements in the format. As part of this for Figure 7, the budget account code ("BAC") is compared with an internal file of valid codes; this check reveals that the input data contains an invalid code. As a result, the order format is redisplayed on the CRT screen. An error code (04), indicating that the code is not valid, appears in front of the BAC field. Error codes are also displayed indicating that the vendor I.D. code is either not valid (04) and that the shelving location field ("SHE"), where a data element value is required, is blank (05). When the data is edited, the system moves the first line containing an error up to the position of fourth line on the screen. The correct lines above it are not redisplayed, although the user can have this done, if needed. When the errors have been corrected--see Figure 8--the format is transmitted a second time and the data is then accepted.

Ordering items without a record already present in the system (i.e., there is no entry for the title in the BMRC file, BIPF, or BCDF) proceeds as follows. An Order Division user searches the on-line files, and when no record is located, issues the command "create". This command supplies the user with a blank bibliographic description input (BI1) format, like the one shown in Figure 9. The user then keys whatever bibliographic data is available. If necessary, the user may also use the additional bibliographic input (BI2) format. The data keyed in may run the gamut from full LC book copy to a brief book request from a library patron. The system requires only a minimal description of an item for purposes of ordering and subsequent In Process File record generation. It is important to note that the entire relevant bibliographic description found for an item is (if

possible) input in the BALLOTS system at the time the item is ordered. The SST code is input along with the bibliographic description in order to indicate the source of the bibliographic data.

The initial burden of searching manual bibliographic sources for established bibliographic descriptions and entries falls on the user in the Order Division at time of ordering. Figure 10 illustrates a National Union Catalog (NUC) contributed entry that the user wishes to input to create an order. In Figure 11, the user has input that description on a BI1 format. Figure 12 shows how the user has keyed in the remainder of the bibliographic data found in the NUC on the BI2 format.

Once the bibliographic description for the item is keyed in and accepted by the system, the user continues by filling in the OR1 format with the same vendor and acquisition information required in processing when a BALLOTS file entry has been found. When all the formats needed to perform a function have been filled in by the user and accepted by the system, the transaction is considered complete. The system then responds "ENTRY PROCESSED - ID = <number> -PDQ = <number>", as shown in Figure 13. If the bibliographic record is from the BMRC file or has just been input in response to a "create" command, a machine-generated I.D. number is assigned to the record, and the record will be added to the BIPF. In the latter case, a BIPF entry consisting of the bibliographic description keyed in by the operator plus acquisition record information is created. If the record were from the BIPF, the additional order information would be appended to the existing BIPF record. If the record were from the BCDF and no BIPF record existed, a BIPF entry would be created for the ordered added copy. The PDQ (Print Data Queue) number is a key assigned to the entry for overnight batch processing of the transaction.

The user has immediate access to all the information input to the BIPF or BCDF, and can examine an updated or just-created record as soon as its entry has been accepted. Access to new BIPF records is limited to the use of the I.D. index until the following day. From then on, the records can be located through any of the available indexes (see above, "THE BALLOTS FILES AND INDEXES"). As well as the addition to the BIPF, overnight processing of the record shown in figures 2-8 produces the purchase order (and a dealer report slip) shown in Figure 14.

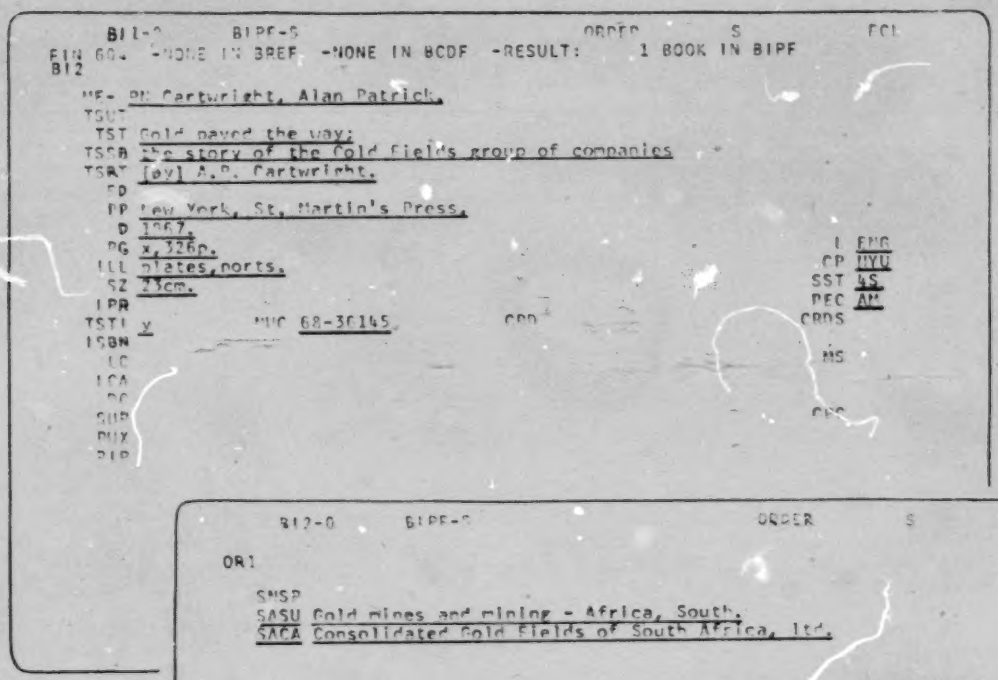
We have looked at one of the primary BALLOTS functions--ordering. The system is divided into eight functions, with which a user can order items, claim and cancel them, receive them, distribute received items, remove standing searches, catalog titles, create catalog references, and perform catalog maintenance. Generally, these functions consist of a sequence of searching, input, and output. The rest of the functions will be discussed further on in this paper.

Cartwright, Alan Patrick.
Gold paved the way; the story of the Gold Fields group of companies [by] A.P.Cartwright. New York, St. Martin's Press, 1967.
x,326 p. plates,ports. 23cm

1.Consolidated Gold Fields of South Africa, ltd. 2.Gold mines and mining - Africa, South. I.Title.
MH-BA MV MH MUC68-36145
CtY

Figure 10. National Union Catalog Contributed Copy

Figure 11. Entering NUC Information on a B11 Format



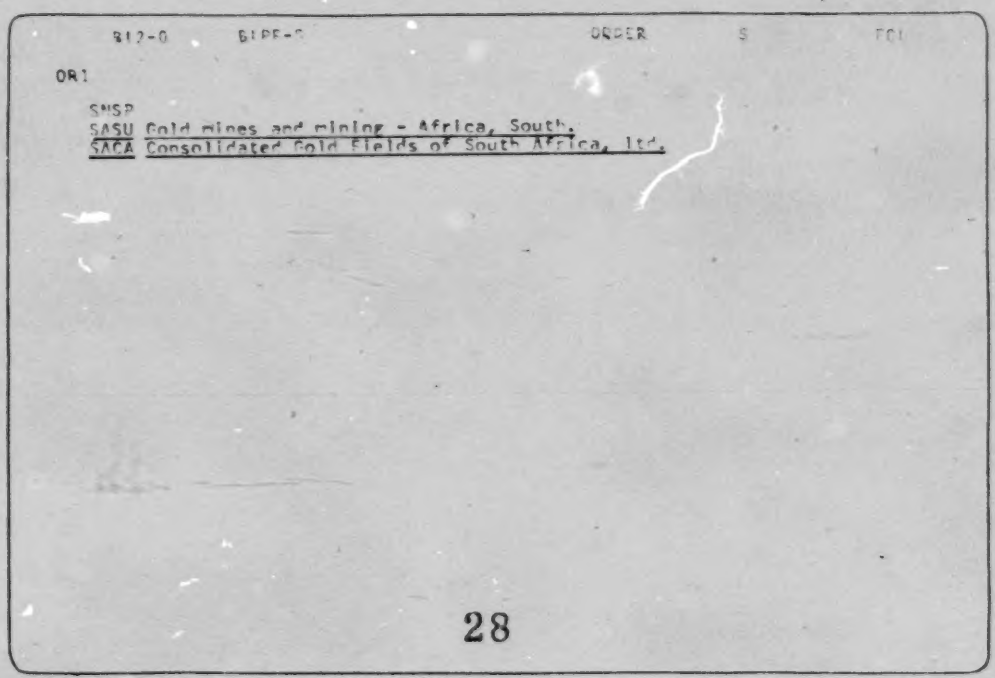

B12-0 BIPF-0 ORDER S FCI
OR1
SMSP
SASU Gold mines and mining - Africa, South.
SACA Consolidated Gold Fields of South Africa, ltd.

Figure 12. Entering NUC Information on a B12 Format

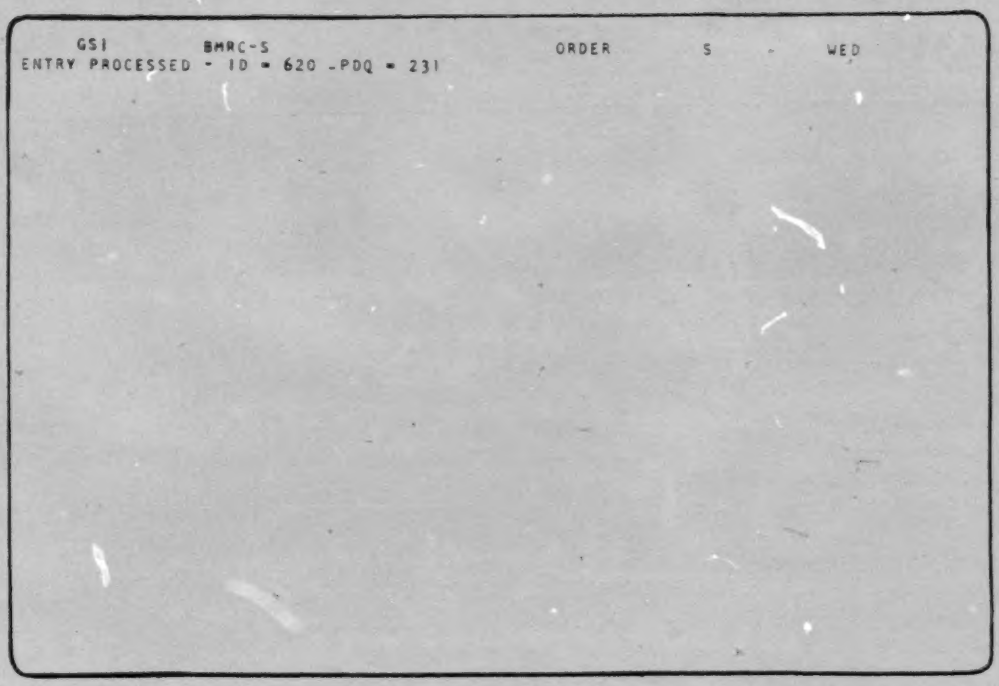


Figure 13. Order Input Format Accepted, Return to General System Format

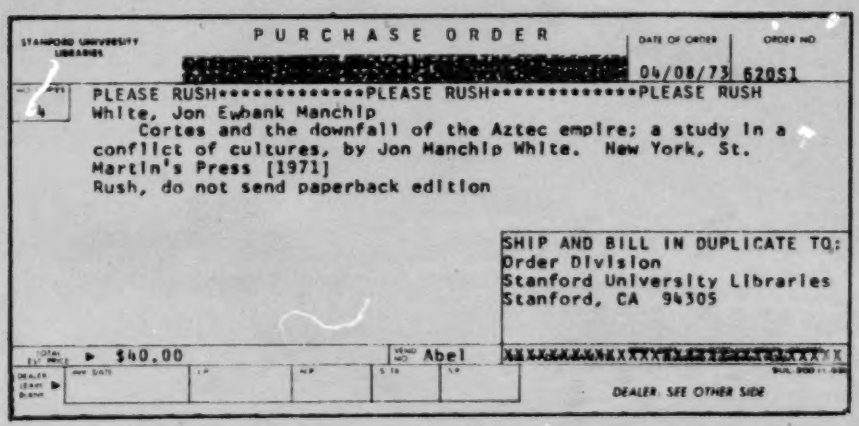

STANFORD UNIVERSITY LIBRARIES
PURCHASE ORDER
DATE OF ORDER
ORDER NO.
04/08/73 620S1
PLEASE RUSH••••••••••••••PLEASE RUSH••••••••••••••PLEASE RUSH
White, Jon Ewbank Manchip
Cortes and the downfall of the Aztec empire; a study in a conflict of cultures, by Jon Manchip White. New York, St. Martin's Press [1971]
Rush, do not send paperback edition
SHIP AND BILL IN DUPLICATE TO:
Order Division
Stanford University Libraries
Stanford, CA 94305
$40.00
Abel
DEALER. SEE OTHER SIDE

Figure 14. Purchase Order

THE PROGRAMMABLE CRT TERMINAL AND BALLOTS SOFTWARE CAPABILITIES

The activities just described demonstrate several basic aspects of the BALLOTS system. But this interaction between the user and the CRT terminal is only the tip of the iceberg that is the BALLOTS system. Having looked at some initial uses of BALLOTS, we can now go a little further into some components of the system.

The terminal used in the BALLOTS system is the Sanders PDS 804 programmable CRT terminal. This terminal includes a microprocessor that permits specific computer programs to be loaded directly into the CRT terminal. These programs control the display of data, the keying, and the communication of the data to the main computer. This terminal can display 1,920 upper- and lowercase characters on a screen, in 24 eighty-character lines. The BALLOTS development staff were able to assign specific functions to certain keys (such as the paging keys described below under "PROTOCOLS AND COMMANDS") to adapt the Sanders terminal to the uses of BALLOTS.

BALLOTS has programmed the terminal so that specified segments of lines on the screen or ranges of lines on the screen can be considered as a single data element field. These fields may be either protected or unprotected. A protected field is one in which the user cannot input data, although the system may display data there. During input at the keyboard, the cursor is prevented from entering protected fields; this constraint is part of the control program loaded in the terminal. (The cursor is a blinking underline character that indicates to the user his position on the screen.) When the user is typing data into a field, he cannot type past that field into another field unless a "NEW LINE" (carriage return) or "TAB" key is depressed. A "NEW LINE" will move the cursor to the first input position on the next line; a lowercase "TAB" will move the cursor to the first input position of the next field (which may be on the same line or a following line). An upper-case "TAB" moves the cursor back to the beginning of the current field, or, if the cursor is already at the beginning of the field, to the beginning of the previous input field.

There are two types of unprotected input fields in the BALLOTS system. One is a fixed-length field and the other is an expandable field. In a fixed-length field, the amount of space is predefined, and only the maximum number of characters allowed for that field may be entered. If the user continues typing, the cursor will not move to the next field, but will remain at the last character position in the current field. Each additional character input will simply replace the last character in the field. The only way to get to the next field is to depress a "TAB" or "NEW LINE" key. If data is being keyed into an expandable field and there is not enough room preallocated in the format, the user keeps typing. As soon as the first character beyond the current end of the field is keyed, the microprocessor immediately inserts a blank line at the end of the overflowing field, and the continued data is input in this new line. (An expandable field always extends to the end of the line.) All the lines on the screen below the overflowing field are pushed down one line on the screen.

It should be pointed out that all of the features described here are programmed into the terminal and are not ___ part of the hardwired logic of the terminal. This flexibility was one of the primary reasons for choosing a programmable terminal.

BALLOTS CRT SCREEN FORMATTING

In light of these basic features of the terminal software, we can now look at the actual screen formats developed for BALLOTS. The order input (OR1) format in Figure 7 is used as the example here, but the rules and methods given apply to all of the BALLOTS formats.

1. The first line in the format is the "control" line; it consists of the following fields.

a. The first field is the format identification: "OR1". This identifies the screen format to the user.

b. The second field is the file I.D.: "BMRC-S". This notifies the user that the BALLOTS-MARC file for Stanford is the source of the current record. If the In Processing File were being used, this field would read "BIPF-S".

c. The third field is the record I.D.: "72-140589". The record I.D. of this title in the BMRC file is "72140589" (its Library of Congress card number). BCDF, BIPF, and BREF records use machine-generated I.D. numbers, rather than LC card numbers, for record identification.

d. The fourth field is the acquisition structure (i.e. purchase order sequence number) of the item being displayed.

e. The fifth field is the function code: "ORDER". The user supplies this information, which describes the type of work he is doing (in this case, ordering). (The use of this field is described in "PROTOCOLS AND COMMANDS," below.)

f. The sixth field is the library identification: "S", for Stanford University Libraries.

g. The seventh field in the control line is the terminal user's initials: "WED".

2. The second line in the format is the message line. This is used by the system to send messages to the user. Among other possible messages, the system here redisplays the search request along with the search results. Figures 4 and 5 illustrate this. If the message to be displayed exceeds one line, only the last portion of the message will be displayed.

3. The third line is the command line; it is used for communication from the terminal user to the computer. This could be a request to conduct a specific search or to display a specific format. An entire command language was developed for the BALLOTS system that includes search commands, requests for formats, paging commands, etc. (Some of these commands will be discussed below.) Uses of the command line can be seen in figures 2, 4, 6, and 7. In Figure 2 the command line was used to search; in Figure 4 it was used to request an order input format; in Figure 6 it was used to modify the criteria for the search in progress. In Figure 7 the system has prompted the command "ENTER" (here abbreviated to the first three letters of the command, i.e. "ENT"), which instructs the system to enter the record on which the user has been working.

4. The remaining lines on the order input format contain fixed-length or expandable fields. If the fixed-length fields are short, more than one field may be placed on the same line. This is shown in figures 7 and 8. When a field is expandable, it must be the only field on a line. The "VSP" field is an example of this.

The eight positions (character spaces) preceding each input field in an input format follow a consistent pattern. The first two positions are for an error code for the data element. If after a format has been transmitted the on-line editing detects an error, an appropriate error code will be displayed in these first two positions, as shown in Figure 8. Position 3 is blank and protected. Positions 4, 5, 6, and 7 contain the data element mnemonic (right-justified). Position 8 is blank and protected. From position 9 to the end of the field is the user input area. Some lines may contain more than one fixed-length field (see "SHE" on the "BAC" line in Figure 8).

SPECIFIC FORMATS

In each function, the user communicates with BALLOTS through a series of screen formats. These formats are of two types: (1) input/update formats (e.g. the order input--OR1--format) and (2) search/display formats (e.g. the partial acquisition record display--PR1--format). The PO/OC module contains 17 different formats, used according to the function specified.

1. GS1. When a user signs onto the system, the first format he sees is the general system (GS1) format. The GS1 is a format that the system displays: (1) when the user first enters BALLOTS; (2) if the user does not give an additional command for the system to process after a record has been entered; (3) if no other format is specifically called for by the user or the function protocol; and (4) if command errors are present in the search request. Such errors are displayed on the GS1 format for correction. In the scratch function (see below), the GS1 is used in purging standing searches from the system.

2. SI1. The search inquiry (SI1) format is used to input search requests. In the command line of the SI1 format, the user inputs a

"find" command followed by search terms. If the search request yields zero results for the file being searched, the system may (if the function protocol permits) continue automatically to search the next available file. If all files yield zero results for the search argument, the user is returned to the SI1 format to begin his search anew.

3. SI2. The search continuation (SI2) format is the format on which multiple search results are indicated. If the search request has resulted in more than one result, the total number of entries found in the file searched is stated in the message line. The user can input modifications of the search on the command line to narrow the search, or he can display the results by keying the "display" command. (See figures 5 and 6 for examples of this format's use.)

4. PR1. The partial acquisition record display (PR1) format displays partial bibliographic information (i.e., main entry, title, pagination, publisher, date of publication, series information) and abbreviated acquisitions information for each order that has been input for the title. Full holdings information is displayed if present. This format provides the user with a quick status report on all the frequently used data in a record; i.e., the status of all items on order, in processing, or already cataloged.

5. AF1. The full acquisition display (AF1) format can be used only if the record is in the BIPF. The AF1 lists the main entry and all the information input on the order input (OR1) format, plus the status of each item not yet cataloged (for example, one item may have been claimed, another two items received and sent to cataloging, and a third item canceled by the requester). A given BIPF record may have several acquisition subrecords appended to it. For each separate purchase order generated for a title, a new order input (OR1) format is used; and a different AF1 format will be used to display each resulting acquisition subrecord in the BIPF record. Each AF1 is clearly labeled to indicate which purchase order data is being displayed. This indication appears in several places on the format. One prominent area is the fourth field of the control line (see above). When all the items associated with a specific purchase order have been cataloged or canceled, the acquisition information for that purchase order is purged from the BIPF. Thus, once orders have been completely cataloged or canceled, an AF1 format can no longer be used to display the record contents.

6. BF1. The full bibliographic display (BF1) format can be used to examine any bibliographic record. This format closely resembles the format of an LC card, and includes the data found on such cards. Mnemonic tags are used only to identify data that is not easily recognizable. (For example, the country of publication code is preceded by "CP".) No acquisition or holdings information appears on this format.

7. BH1. The partial bibliographic/full holdings display (BH1) format can be used to examine any BCDF record. The most-used elements

of an item's bibliographic description are displayed on this format, together with a full display of all the holdings (i.e. cataloged items) recorded in the BCDF.

8. BI1. The bibliographic input (BI1) format is used to input or modify bibliographic information. This format can be used in various functions. Mnemonic tags are used to identify all the input fields. Bibliographic data can be input by keying data into the correct field. Data present in a record can be modified by keying over it. Several programmed function keys, such as "DELETE", "INSERT", and "CLEAR", are provided on the CRT terminal to aid in data modification. The BI1 is used to input or modify the body of the bibliographic description from the main entry up to and including the collation statement (pagination, illustrations, and size).

9. BI2. The additional bibliographic input (BI2) format is used to input or modify the remainder of the bibliographic description of a title (see BI1 above). Notes and tracings are input on this format. All data elements must be tagged with their mnemonic labels. When data is prompted on this format from a file, each data element is shown tagged.

10. HF1. The full holdings (HF1) format is a display format that indicates only the main entry of the book and the full holdings record present in the BCDF.

11. OR1. The order input (OR1) format is used to enter order information into the system. In addition to such routine information as vendor and price, values may be input for requesters, special shipping information, special purchase order messages, searching information, and various kinds of notes. Codes can be input (and in some functions updated) that will result in requester notices being printed either when the book arrives or when it is cataloged.

12. RX1. The acquisition matrix (RX1) format is an input format with an item-by-item breakdown of all the items ordered on one OR1 format (i.e., on one purchase order). The RX1 format allows the user to indicate receipt either of an entire order, or of individual items in the order. Claims against an order, or against part of an order, and cancellations may also be input on this format. RX1 is also used to change the processing status of a book. (For example, suppose the book has been moved from a holding area, where it had been waiting for MARC catalog copy to arrive, to an original cataloger's rush processing station.) Thus, for each set of data input on an OR1 format, the display format AF1 and the input format RX1 are available. When asking either for the display of the data on an AF1 format or for the presentation for update of the data on an RX1 format, the user generally specifies the record by purchase order sequence number.

13. HH2. The holdings input (HH2) format allows the user to input the call number, the location, and the copy number of an individual item, as well as whatever variant imprint information may be present for the item. The user can specify that catalog cards and

spine labels be produced, as well as additional catalog cards for special-purpose catalogs. Special messages (e.g. "For more information see ...") may be input for printing on the catalog cards. The HH2 presents data for all the items received and available for cataloging in a BIPP record. If a MARC record can be located in the BMRC file for a book that was ordered through the manual system, that book can also be cataloged on the HH2 by inputting the location and copy number information in a special area of the format. This will cause a BCDF record to be created for the items cataloged.

14. HU1. The holdings update (HU1) format is available only in the catalog maintenance function (see below). On this format is keyed information about the transfer, withdrawal, or loss of items in the library. The title can be reclassified and any of its holdings data modified. All the items cataloged in a record are displayed on this format, along with their status. The user may modify either single items in a record or the entire holdings.

15. RF1. The reference display (RF1) format is used for complete display of reference records present in the BREF file. This format resembles that of a reference card.

16. RI1. The reference input (RI1) format is an input format that allows the user to input a reference record into the BREF file. Several types of references may be input, together with reference card generation instructions, reference source data, and reference catalogers' initials. RI1 can also be used for updates to existing reference records.

17. ER1. The error (ER1) format appears when a command error has been made during the attempt to enter update material in a record or to generate some output. A diagnostic error message appears in the message line. The user corrects his command statement. BALLOTS then continues to process the user's input.

PROTOCOLS AND COMMANDS

BALLOTS contains a system of "protocols" to aid the user. A protocol prescribes the formats and commands the user should employ to carry out a given function. The objective of the protocol is twofold. First, the protocol provides a default path through the function for the user. It presents the formats and commands that the user is most likely to use, in the order in which he is most likely to use them. This relieves the user from explicitly specifying each step in a routine procedure that he performs frequently. The user can override default options with specific requests, if he needs other formats or commands to complete his work. Second, the protocol sets up boundaries to orient the user. If the operator tries to cancel an order in the cataloging function, or to catalog a book without providing holdings information, the protocol will provide an appropriate error message. The control line of every CRT format displays the function name, so that the user can always tell which protocol he has selected.

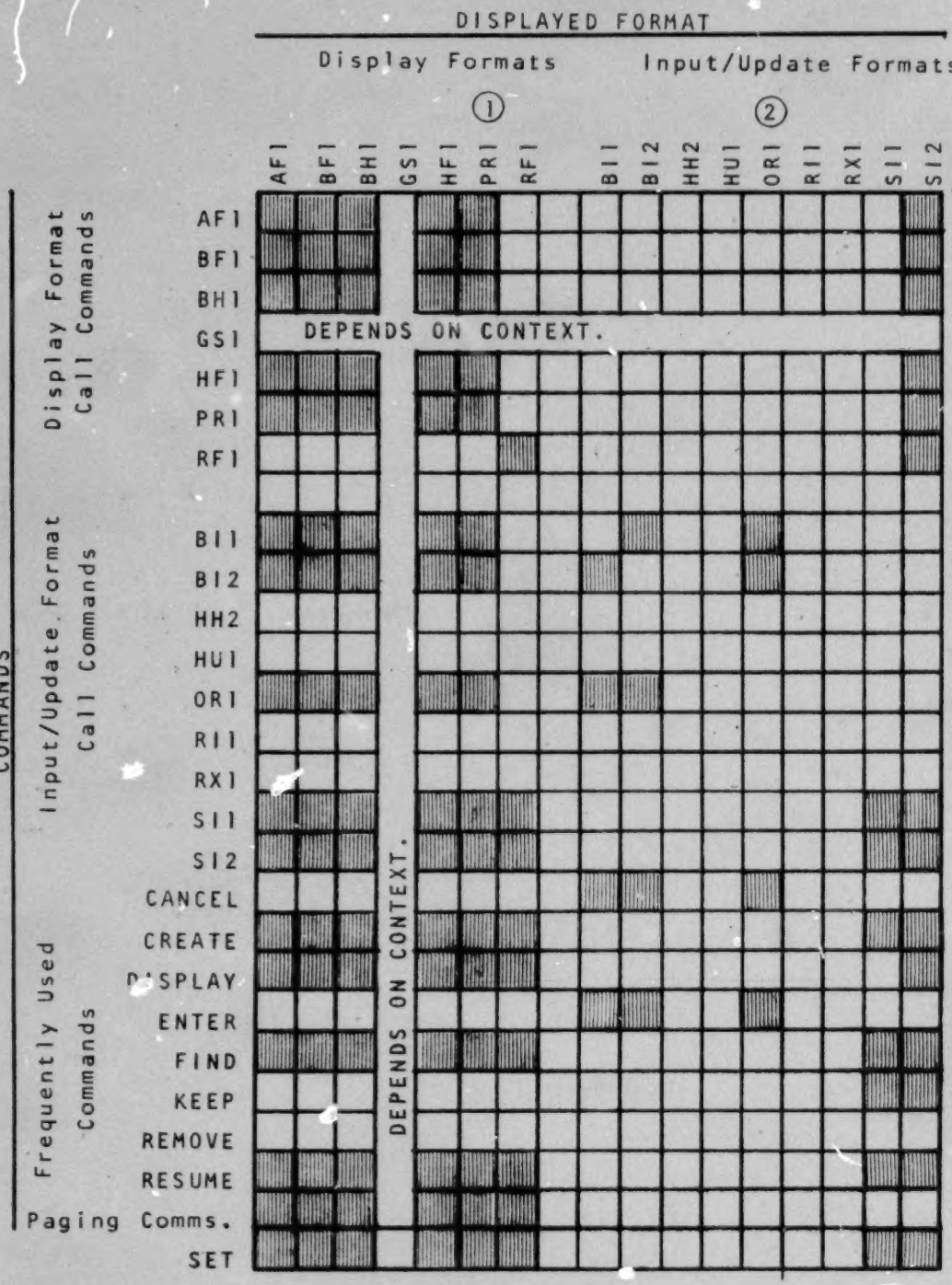
If the user does not request a variance in the basic default sequence of formats in a protocol, the default formats are automatically displayed one after the other as each is successfully completed. For example, on the third line of Figure 4, the ordering protocol automatically supplies a request for the order input (OR1) format; this is the default request following the display of a partial acquisition record display (PR1) format when a single record is found.

A protocol table for the order function is shown in Figure 15. This is a simplified diagram representing the protocol (sequence of operations) possible in ordering. For example, when the partial acquisition record display format (PR1) is in use, the user may:

1. Request a full acquisition display (AF1) format (the AF1 format is only available for records in the BIPF)
2. Request a display of the full bibliographic record (BF1)
3. Request a partial bibliographic/full holdings (BH1) format for examining data found in the search
4. Request a full holdings (HF1) format for examining holdings data in a record found in the search (the BH1 and the HF1 formats are only available for records in the BCDF)
5. Request a bibliographic input (BI1) format for modifying data
6. Request an additional bibliographic input (BI2) format for modifying data
7. Go directly to an order input (OR1) format (default option)
8. Begin a new search on a search inquiry (SI1) format
9. Continue interactive searching on the search continuation (SI2) format if more than one record was found
10. Issue the "create" command and follow the default path of inputting data on the BI1, BI2, and OR1 formats
11. Request the system to "display" the first record of the search result
12. Begin a new search ("Find...")
13. Issue the "resume" command to search the next available file
14. Page to the next bibliographic record if several are found in a search.

Each protocol automatically displays certain commands in the third line of the format; these can be changed by the user if the default option is not desired. (In Figure 15, the default sequence is indicated by the circled numbers next to certain display formats.) There are several types of commands.

One type of command tells the system which format the user wants to use next. These commands are simply the format I.D.'s (AF1, BI1, HH2, etc.).



Look under the "DISPLAYED FORMAT" heading at the top of this page to find the format currently displayed on the CRT terminal screen. The column at the left side of the page is an abbreviated summary of BALLOTS commands. The commands that can be given on the displayed format are indicated by shading.

Sequence of file searching: BREF, BCDF, BIPF, BMRC
Sequence of default formats: indicated by circled numbers

Figure 15. Order Function Protocol Chart for PO/OC Module

A second type instructs the system on how to handle the contents of the current set of formats. For example, the "enter" command would cause all of the data elements on the current format and on all previous formats used in the protocol to be processed and used to update the file. The "cancel" command would cancel all the steps taken so far in the current protocol.

A third type is the search commands. These commands use any of the available file indexes; search terms can be combined by using the logical operators "and", "or", "not". An example of the first of these logical operators is shown in Figure 3. Here all three criteria must be satisfied in each record found. If the user is not sure of a search term, he can input likely alternative terms, using the "or" operator. This approach will produce a larger number of search results. If the user has determined that certain elements will not be part of the result he is after, he can list these following the logical operator "and not", and thus further refine his search criteria.

Paging commands are used to instruct the system to display additional data. If a particular record is too long to be displayed on the CRT screen (24 lines) all at once, the "+" command allows the user to "page" forward (by displaying succeeding lines of the record). Backward paging is provided by the "-" command. A special programmed function key is provided for keying "+" or "-" commands.

When the user is working with a record from the In Process File (BIPF), the record may have several different acquisition subrecords attached to it. For example, one title may be ordered on several purchase orders with different requesters, budget accounts, vendors, etc.). These individual acquisition subrecords may be examined separately on the full acquisition display (AF1) format. Since only one set of acquisition data is displayed per AF1 format, paging between multiple AF1 formats for a record is accomplished through the use of the "+A" command. A programmed function key is provided to do this kind of paging.

When a search has produced several bibliographic records, the user may need to review each of the records found. By requesting a display of the first record and then paging forward to the other records, the user can inspect the search results until he finds the correct record. This is accomplished by keying "+B" (for the next bibliographic record) or "-B" (for the previous bibliographic record) in the command line. Again, a key on the BALLOTS CRT terminal has been programmed for these commands.

Commands can be linked in order to reduce the number of formats required to process a book. For example, the user can combine the "enter" command (to complete the ordering process) with the "find" command (to search the file for the next book to be processed), keying both commands in the command line, separated by a slash. This is called command chaining. If both the entry and the search are successful, a PR1 or BF1 format will appear for the next book, with "ENTRY PROCESSED - ID = <number> -PDQ = <number>" for the previous

entry and the new search command and results displayed in the message line.

Additional commands in the BALLOTS system are described in the BALLOTS SYSTEM REFERENCE MANUAL (see "ADDITIONAL REFERENCES").

OTHER BALLOTS FUNCTIONS

File searching and the ordering function were described above against very little background. In describing the other functions however, we can draw on some of the concepts covered in the explanations of software, formats, and protocols. Since each function requires different formats and actions, each function has its own protocol, with a sequence of default formats for accomplishing the object of the function. The protected fields (those not accessible to the user) on a format may vary depending on the function in which the format is being used.

The Claim/Cancel Function

To either claim or cancel items on order, the user first finds the record through the search logic described under "SEARCHING" and "ORDERING." (This search is usually done by the order number.) The default format that the system supplies in the claim/cancel function is the PR1 format in Figure 16, on which all the items on order for a record, as well as part of their order information, and all items cataloged are displayed. In the example shown here, the PR1 indicates that the four items ordered are still on order and that no action has been taken against the items in the record. The user wishes to cancel one copy and to issue a first claim against the other three copies displayed.

The RX1 format (Figure 17) lists each purchase order item in a particular purchase order. The displayed data for each item includes the item number (e.g., 620S1.1), created by combining the record's unique I.D. (generated by the system) with the library identifier (in this case "S" for Stanford), the purchase order sequence number, and the purchase order item number. This data element provides the system with a unique inventory number for every single item processed. Also shown are item instruction input fields (INST), acquisition status codes, and dates. In this example there are no processing status codes and dates, because no material has yet been received. The acquisition status codes indicate that the items were ordered on April 8, 1973, and that they have not yet been received, claimed, or canceled.

To cancel the first item, the user keys the instruction "cnq", meaning "canceled by requester." For the remaining three items present, the user keys "cl1"; this code instructs the system to print a first claim notice for the items on order. (Second claims may be generated at a later date by keying "cl2".)

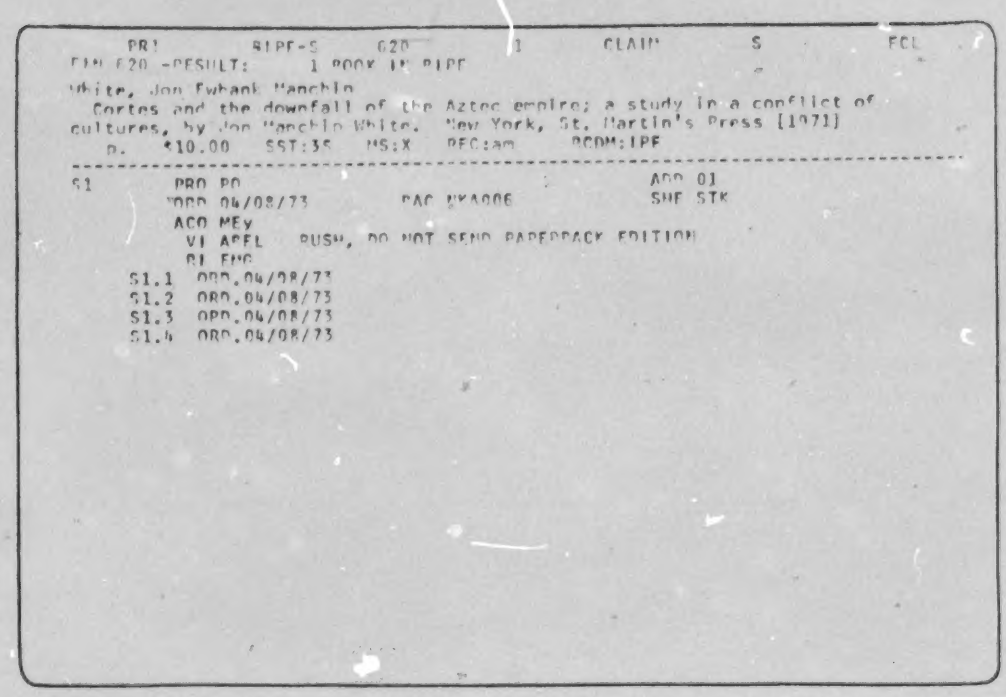

PRI PIPE-S 620 1 CLAIM S FCL
FIN 620 -RESULT: 1 BOOK IN PIPE
White, Jon Ewbank Manchip
Cortes and the downfall of the Aztec empire; a study in a conflict of
cultures, by Jon Manchip White. New York, St. Martin's Press [1971]
P. $10.00 SST:3S MS:X REC:am RCDM:IPE
S1 PRO PO ACQ 01
ORD 04/08/73 PAC MXA006 SHF STK
ACQ MEy
VI APEL PUSH, DO NOT SEND PAPERBACK EDITION
RI ENG
S1.1 ORD.04/08/73
S1.2 ORD.04/08/73
S1.3 ORD.04/08/73
S1.4 ORD.04/08/73

Figure 16. Partial Bibliographic and Partial Acquisition Information Displayed on the PRI Format

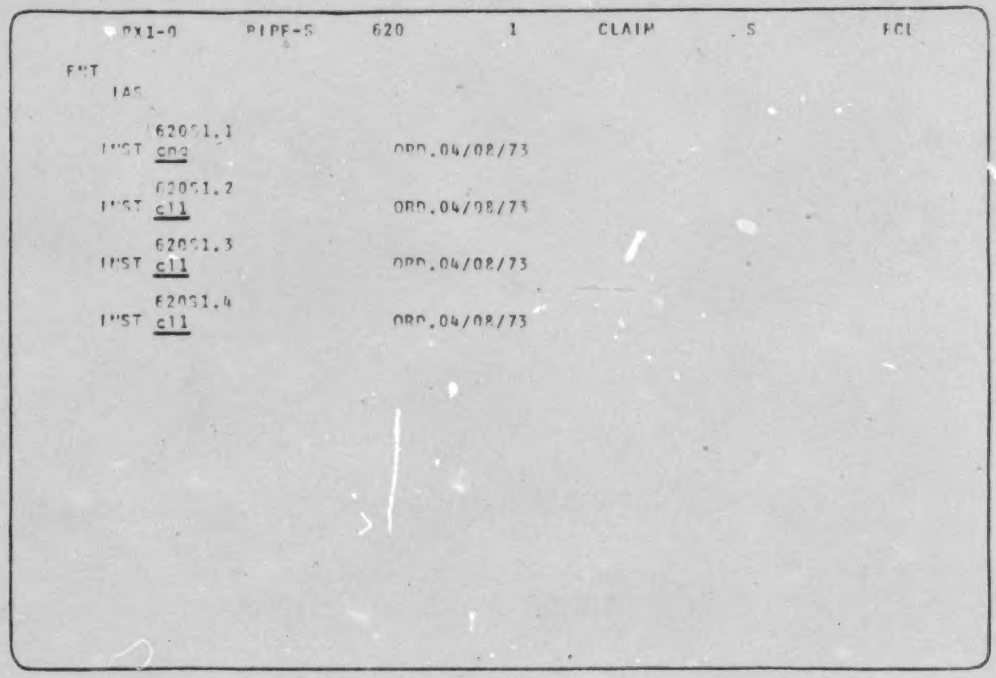


Figure 17. Use of the Acquisition Matrix (RX1) Format in Claiming and Canceling

The printed outputs resulting from this on-line activity are a cancellation notice to the vendor for the first item, shown in Figure 18, a notice of cancellation to be sent to the requester, two Cancel File slips, and a claim letter with claim forms for the other three items, shown in Figure 19.

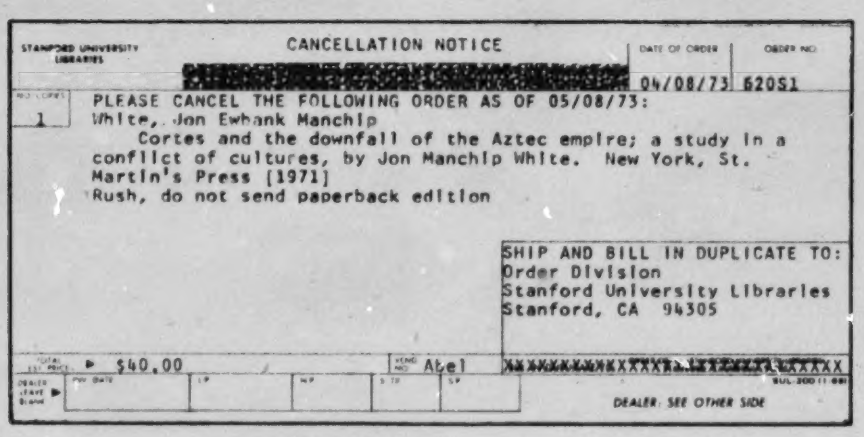
If all the items present in the record had been canceled, the entire record would have been deleted from the BIPF. For every cancellation, the system produces Cancel File slips. These slips are placed in a manual file, to be referred to if the vendor fills the order after cancellation.

The Receiving Function

To receive books ordered through the automated system, the user first locates the record in the BIPF, usually by the I.D. number. The default format on which the record is displayed is the PR1. The input format used to receive either partial or complete orders is the RX1 format.

In Figure 23, two of the items on order are being received. The user keys an M (for "material received") in the INST fields for these items. The item that was canceled and the item that remains on order are unaffected. The system prompts "ENTER" (for system processing) in the command line; the user need only press the SEND key on the terminal to cause this command to be carried out. The record is updated with the input receipt information.

However, let us assume that an additional request for the book has been made to the library by a patron who needs it immediately. To update the BIPF record with this additional requester information, the user, after locating the record but before inputting receipt data on the RX1 format, changes the default command "RX1" to "AF1". The result is an AF1 format that shows all of the data associated with the first purchase order that was input (Figure 20). After examining this data, the user decides to update the order record. He enters the command "OR1". This results in the OR1 format for the first purchase order input. The OR1 in Figure 21 looks as it did when the previous user had finished with it in the order function. The user now updates the SNI (special notification indicator) field with a code (in this case "4") that will produce a requester notice, shown in Figure 22, for an additional requester at the time of cataloging. The user then keys a rush cataloging request in the CAT (notes to cataloging) field. He fills in the additional requester fields (N-) with the name of the additional requester in the N field and the additional requester's street address in the NSD field. Because the additional requester's city and state field (NCS) is left blank, the system will assume that the requester's city is Stanford. If the additional requester were to be notified off campus, the user would enter his city and state in this field. After he has completed this updating, the user changes the new default command "ENT" to "RX1", and now proceeds to add the receipt data in Figure 23, as described in the preceding paragraph.



STANFORD UNIVERSITY LIBRARIES

CANCELLATION NOTICE

[redacted] 04/08/73 620S1

NO. COPIES 1

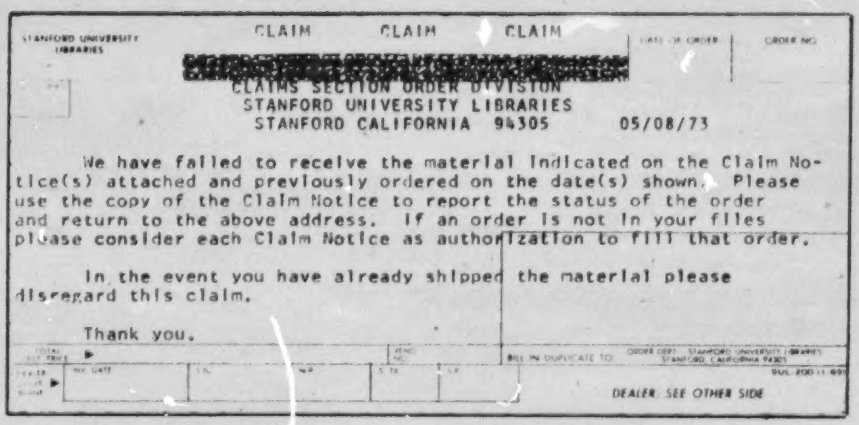
PLEASE CANCEL THE FOLLOWING ORDER AS OF 05/08/73:
White, Jon Ewbank Manchip
Cortes and the downfall of the Aztec empire; a study in a conflict of cultures, by Jon Manchip White. New York, St. Martin's Press [1971]
Rush, do not send paperback edition

SHIP AND BILL IN DUPLICATE TO:
Order Division
Stanford University Libraries
Stanford, CA 94305

$40.00 Abel [redacted]

DEALER: SEE OTHER SIDE

Figure 18. Cancellation Notice



STANFORD UNIVERSITY LIBRARIES

CLAIM CLAIM CLAIM

[redacted]

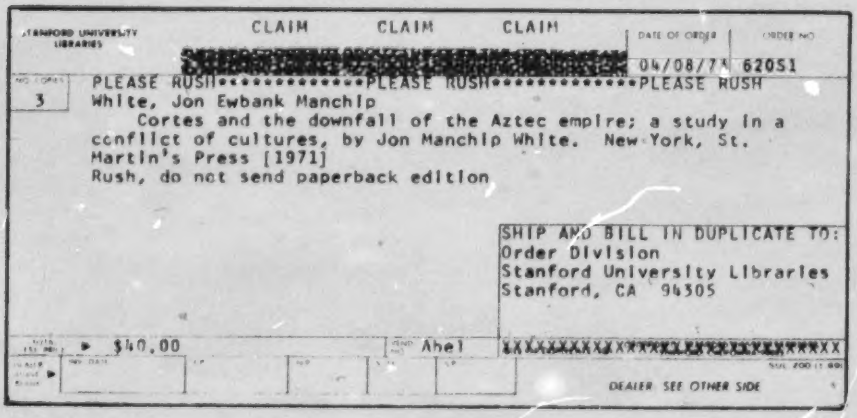
CLAIMS SECTION ORDER DIVISION
STANFORD UNIVERSITY LIBRARIES
STANFORD CALIFORNIA 94305 05/08/73

We have failed to receive the material indicated on the Claim Notice(s) attached and previously ordered on the date(s) shown. Please use the copy of the Claim Notice to report the status of the order and return to the above address. If an order is not in your files please consider each Claim Notice as authorization to fill that order.

In the event you have already shipped the material please disregard this claim.

Thank you.

DEALER: SEE OTHER SIDE



STANFORD UNIVERSITY LIBRARIES

CLAIM CLAIM CLAIM

[redacted] 04/08/73 620S1

NO. COPIES 3

PLEASE RUSH••••••••••••••PLEASE RUSH••••••••••••••PLEASE RUSH
White, Jon Ewbank Manchip
Cortes and the downfall of the Aztec empire; a study in a conflict of cultures, by Jon Manchip White. New York, St. Martin's Press [1971]
Rush, do not send paperback edition

SHIP AND BILL IN DUPLICATE TO:
Order Division
Stanford University Libraries
Stanford, CA 94305

$40.00 Abel [redacted]

DEALER: SEE OTHER SIDE

Figure 19. Two-Part Claim Letter

Figure 20. Full Acquisition Display Format

```
     AF1        BIPF-S     620          1        RECEIPT      S          CLE
FIN 620 -RESULT:     1 BOOK IN BIPF                                  AF1  1 of  1
RX1
White, Jon Ewbank Manchip
S1       PRO PO                                  ADD 01
         ORD 04/08/73          PAC NKA006        SHE STK          SI FCL
        RCOM LPF               SNI 2              PP $40.00
ACO MEy
 VI APEL
 VSP RUSH, DO NOT SEND PAPERBACK EDITION
 RI EMG
     S1.1  CNO.05/08/73
     S1.2  CL1.05/08/73
     S1.3  CL1.05/08/73
     S1.4  CL1.05/08/73
```

```
     OR1-0      BIPF-S     620          1        RECEIPT      S          CLE

RX1
     PRO PO                ADD 01                CLT
       X                   DAN                    PO
     SNI 24                 SO                  SI FCL          ORD 04/08/73
     MDX 4
      PP $40.00
     PAC NKA006            SHE STK
      R- 1 EMG
     RSO
     RCS
      V- 1 APEL
     VSO
     VCS
     VSP RUSH, DO NOT SEND PAPERBACK EDITION
     VCT
     CAT Rush Cataloging Please
     ACO MEy
      N- n Professor Gildersleve
     NSO Dept. of History
     NCS
```

Figure 21. BIPF Record Update on the ORI Format in Receiving

```
TO REQUESTER:  THIS TITLE HAS BEEN RECEIVED IN
THE STANFORD LIBRARIES.  IF YOU WISH PRIORITY
CATALOGING, PLEASE ADVISE THE CATALOG DEPT.

White, Jon Ewbank Manchip
  Cortes and the downfall of the Aztec empire;
a study in a conflict of cultures, by Jon
Manchip White.  New York, St. Martin's Press
[1971]


SHELVE:STK      ORDER NO:620S1      BAC:NKA006
REQ. BY: Elmer Grieder
         Main Library

05/15/73
```

Figure 22. Requester Notice

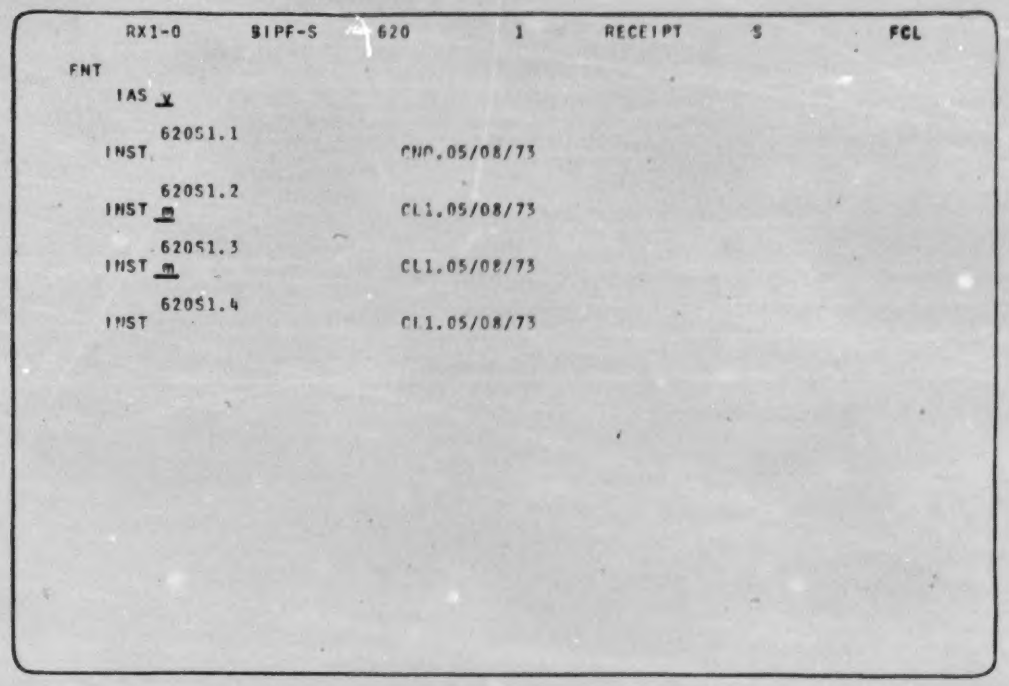


Figure 23. Use of the RX1 Format in Receiving

This updating of order information input on the OR1 format is possible in the claim/cancel function and the distribution function as well as in the receipt function. But not all of the data elements on the OR1 format can be updated in the claim/cancel, distribution, and receipt functions. For instance, the vendor (V-), method of procurement (PPO), and address code (ADD) are protected and cannot be changed.

The printed outputs resulting from the above actions will be a catalog data slip (Figure 24) to be placed in the book the following morning before it is sent on to distribution, and a requester notice for the first requester (see the R field on Figure 21.)

The Distribution Function

The Distribution and Searching Unit of the Catalog Department uses the distribution function to route items within the stream of technical processing. In this highly flexible function, items may be cataloged, held for later processing, sent to professional catalogers for original cataloging, sent to the bindery for binding, and so on.

Books arrive in the Distribution and Searching Unit from receiving and are immediately separated into two categories: (1) those books for which a BIPF entry exists, and (2) those books without a BIPF entry. All books with BIPF records are accompanied by a catalog data slip that was generated at the time of receipt. Among other information printed on the catalog data slip is a code that indicates the source and status (SST) of the bibliographic data. Further processing of these books is partially determined by this SST code.

The Purchase Order and Original Cataloging module supports five categories of bibliographic information, all of which are identified by the SST code. These categories are (1) Stanford original cataloging entries, (2) LC contributed cataloging copy (i.e., book catalog copy that originated at the Library of Congress or on Title II LC cards), (3) MARC originated copy, (4) National Union Catalog (NUC) contributed copy other than LC originated copy, and (5) entries copied from "other" sources (e.g. publishers' catalogs, book request slips, etc.).

When books are accompanied by catalog data slips (i.e., they have a BIPF entry), the Distribution Unit examines the SST code, the bibliographic data present on the catalog data slip, and the title page of the item. If the SST code is 1 (indicating that the BIPF entry was copied from an already existing BCDF record), the book is an added copy. This item would then be sent on to the Added Copy Processing Unit. If the SST code is 2 (indicating that LC copy was used to order the book), the Distribution Unit can itself catalog the item on-line or else send the item to the LC Processing Unit. If the SST code is 3 (indicating that a record in the BMRC file was used to order the item), the Distribution Unit has the option of cataloging the item on-line (if no complications are present) or of routing the book to the LC Processing Unit. If the SST code is 4 (indicating that a bibliographic

F1230.W46 1971

620S1
STK
SST:3S

MEy
CAT:Rush Cataloging Please

White, Jon Ewbank Manchip
  Cortes and the downfall of the Aztec empire; a study in a conflict of cultures, by Jon Manchip White. New York, St. Martin's Press %1971%.
  p. illus.,maps,plans,ports. 25 cm.

  Bibliography: p.%335%-339.

  1.Mexico - History - Conquest, 1519-1540. 2. Cortes, Hernando, 1458-1547. I.TITLE.
CRD:72-140589

ORD:04/08/73
PRO:PO SI:FCL BAC:NKA006 SNI:24
VENDOR:ABEL
PR:$40.00

1.2 MRI.05/15/73 DIS.05/05/73
1.3 MRI.05/05/73 DIS.05/05/73

ITEMS ON ORDER OR RECEIVED AND NOT YET CATALOGED.
1.4 CL1.05/08/73

CP:NYU L:ENG REC:AM CI: MS:X

INPUT BY

PRNT:
ETC:
FMI:

DATE

SUL 222

35

Figure 24. Catalog Data Slip
(full size)

description from an NUC contributed source other than LC was used in ordering), the item is routed to an original cataloger, or to some other processing station within the Catalog Department. If the SST code is 5 (indicating that copy found in some "other" source was used), the Distribution Unit might route the book to an original cataloger, or to a holding area to await either an expected MARC description for the item or an expected Title II card.

If a MARC record is expected, the Distribution Unit creates an entry for the item in the Standing Search request file (BSSR), the book on to a holding area. When the MARC record arrives, the Distribution Unit is notified with a matched SSR notice. If, on examination, the matched BMRC file entry is found to correspond correctly to the item being held, the Distribution Unit may be able to catalog the item on-line using the BMRC file entry. When complications exist, the unit sends the item either to the LC Processing Unit or to a cataloger for original cataloging.

If a Title II card is expected, a Title II File slip is requested and the book then sent to the holding area. The Title II slip is filed in the Title II File by title entry, and when the Title II card arrives, the filer matches the card against the file slip and sends both card and slip to the Distribution Unit. The Distribution Unit then routes the item to the LC Processing Unit. A Title II File slip is shown in Figure 25.

A major advantage of the automated distribution function is that the processing status of items can easily be updated to route the item to the technical processing station able to process it most efficiently. Additionally, if any item must be located within the stream of technical processing, it can be found in a few moments by calling up the record on a PR1 format and examining the process control code (PCCD) displayed on the format. The Distribution Unit performs its activities on a variety of formats, depending on the kinds of processing actions it is taking. However, one format--the Acquisition Matrix (RX1)--is always used except where the item is immediately cataloged on-line. On the RX1 format, the Distribution Unit updates the process control code by indicating in the instruction field (INST) the routing of the item.

Suppose that an item is held awaiting an expected MARC record for several months and then suddenly a patron needs the book cataloged at once for immediate use. After being notified of the new rush status of the book, the Distribution Unit locates the record and sees that the process control code indicates that the item is being held for a MARC record. After retrieving the book from the holding area, the Distribution Unit performs one last check of the BMRC file to make sure that a bibliographic entry for the book has not arrived. If a record is found in the BMRC file, the item can immediately be cataloged on-line in the distribution function. However, if a BMRC record is not found (and this is usually the case), the RX1 format for that item is called up and the user keys into the instruction field the initials of

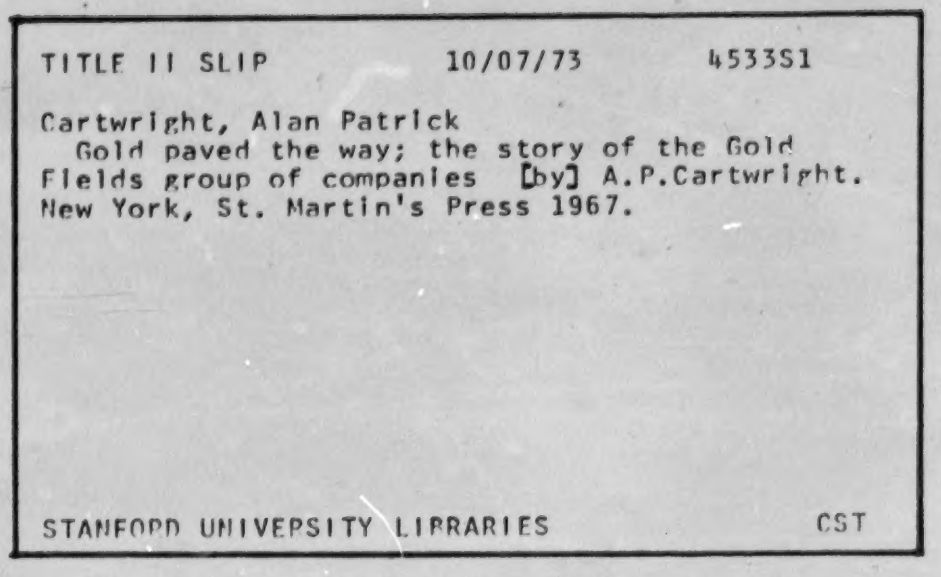

TITLE II SLIP 10/07/73 4533S1
Cartwright, Alan Patrick
Gold paved the way; the story of the Gold Fields group of companies [by] A.P.Cartwright.
New York, St. Martin's Press 1967.
STANFORD UNIVERSITY LIBRARIES CST

Figure 25. Title II File Slip
(full size)

the cataloger to whom the item is being assigned for rush cataloging. The item is then delivered by the Distribution Unit to the cataloger, who begins to catalog the item.

If the patron wished to be notified when the book was cataloged, the Distribution Unit could update the requester or additional requester fields and the SNI (special notification indicator) field on the OR1 format associated with the item. This OR1 updating would follow the same procedures as described in the receiving function above.

Items arriving in the Distribution Unit that have not previously been processed through the automated system (e.g. gifts or exchanges) are searched against the BCDF, the BIPF, and the BMRC file. If a BCDF record is found, the item is sent on to the added copy unit for cataloging. If a BIPF entry is found, the item may (depending on the SST code) be cataloged on-line, held for later processing, or sent on for original cataloging. If a BMRC file record is found, the item may be cataloged on-line or sent on to the LC Processing Unit with CRD (LC card number) noted on the manual processing slip. If no BMRC record is found, a BSSR file entry may be created for an item for which a MARC record is expected.

The distribution function is complex, but allows for the most efficient processing possible. It also enables the library to change the processing route of an item quickly and with a minimum of disruption. Printed outputs that can result from the distribution function are: catalog cards, spine labels, requester notices, and Title II File slips.

The Cataloging Function

In the catalog function, the Catalog Department establishes the bibliographic description of an item and assigns it a call number, shelving location, copy number, and so on. As described in the preceding function, the BALLOTS system supports several types of cataloging in this function (cataloging from the BMRC file, LC processing, original cataloging, NUC contributed copy cataloging). Regardless of the source of the bibliographic description, all the actions that result in the creation of a Catalog Data File (BCDF) entry are carefully checked to conform both to accepted cataloging conventions and to Stanford University Libraries cataloging standards.

Assume that the book ordered through BALLOTS at the beginning of this paper has been received and has been sent to the LC Processing Unit with the catalog data slip (Figure 24) produced in receiving. A member of the catalog staff keys in the search request shown in Figure 26, consisting of simply the "find" command, the search term mnemonic for the record identification number ("ID"), and the actual I.D. number.

Figure 26 shows the results of the search on the full bibliographic display (BF1) format. After examining the book in hand, the user in the LC Processing Unit requests a full display of the bibliographic data. Reviewing the book in hand and comparing it with both the data displayed on the screen and the Stanford catalog, the user sees that a subject heading given in the record differs from the subject heading established at Stanford. In addition, the staff member wishes to add a pagination statement to the record. The data in the In Process File (BIPF) must therefore be corrected before catalog cards are produced from it. Since the bibliographic data displayed on the BF1 is protected and cannot be altered by the user, he must request an input format. The user accomplishes this by overriding the default command line ("HH2") with the command "BI1"--a request for the bibliographic input format. (The user is thus using one of the options in the catalog protocol, rather than following the path of system-prompted steps.) The system responds to this request by displaying the BI1 with the data from the BIPF record displayed on it (Figure 27). The user then moves the cursor to the line on which PG (pagination) appears and adds the pagination. Returning to the command line, the user again overrides the default command ("HH2"), this time with the command "BI2". When the BI2 format appears (Figure 28), the user modifies the SAPN (Subject Added entry, Personal Name) field to conform with Stanford University's established entry. In this case, "Cortes" is changed to "Cortez".

Once this format has been sent to and accepted by the system, a default holdings input (HH2) format is displayed--see Figure 29. The user enters the information shown in the underlined areas. The default data in the CAL field, if left unchanged by the user, indicates that the user accepts the Library of Congress assigned classification as the Stanford call number. The data in the CI field is the cataloger's initials, which the system supplies here on the basis of the user's initials, displayed at the end of line one of the format. When added copies are processed, the value of CI continues to be the initials of the cataloger of the first copy. The data input into the first instruction field (PRNT) specifies the kinds of printed outputs desired. In this example, the user accepts the default instruction to print both catalog cards and spine labels. The data input into the ETC field requests extra main entry catalog cards for the Latin American Curator and the Sacramento State Union catalog. The MLOC (main location) field cannot be filled in by the user; it will be used by the system to keep track of the shelving location printed on the catalog cards in the main public catalog. The FMI (for more information) field provides for the printing of special messages on the catalog cards. Here the user may input codes that will result in "For more information..." messages. (In this example, the user has not called for the printing of these messages.) The next input field is shelving location (LOC). This field is prompted with the anticipated shelving location input during the order process.

In Figure 29, the user has changed the prompted LOC value "STK" (stack) to "IAH" (Institute of American History) for the second item displayed. Following LOC is the unique I.D. number of the item being

```
    BF1        BIPF-S     G20                    CATALOG        S              CF
FIN 620  -NONE IN BREF  -NONE IN BCOF  -RESULT:     1 BOOK IN BIPF
WH2
White, Jon Ewbank Manchip
  Cortes and the downfall of the Aztec empire; a study in a conflict of
cultures, by Jon Manchip White.  New York, St. Martin's Press [1971]
  Illus.,maps,plans,ports.  25 cm.  $10.00

  Bibliography: p.[335]-339.

  1.Mexico - History - Conquest, 1519-1540.  2.Cortes, Hernando, 1458-1547.  I.
TITLE.
72-140589
F1230.W46 1971
SST:35   CP:NYU   L:ENG   REC:AN      MS:X              BCOM:IPF
ORD:04/08/73
```

Figure 26. Catalog Search Request Displayed on the BF1 Format

```
    BI1-0      BIPF-S     G20        1        CATALOG        S              CF

BI2
   MF- PN White, Jon Ewbank Manchip
  TSUT
   TST Cortes and the downfall of the Aztec empire;
  TSSP a study in a conflict of cultures,
  TSPT by Jon Manchip White.
    ED
    PP New York, St. Martin's Press
     D [1971]
    PC 352p.
   ILL Illus.,maps,plans,ports.                                        L ENG
    SZ 25 cm.                                                         CP NYU
   LPR $10.00                                                         SST 35
  TSTI y          PUC                    CRD 72140589                REC AN
  ISBN                                                               CRDS
    LC F1230.W46 1971                                                 MS X
  ICA
    DC
  SUP                                                                 CPC
  PUX
  RIP
```

Figure 27. Use of the Bibliographic Input (BI1) Format

```
BI2        BIPF-S     620          1          CATALOG          S          GE

HH2
   SNSP
   NB   Bibliography p. [335]-339
   SASU Mexico - History - Conquest, 1519-1548
   SAPN Cortez, Hernando, 1485-1547.
```

Figure 28. Use of the Additional Bibliographic Input (BI2) Format

```
      HH2-0      BIPF-S     620          1          CATALOG          S          GE
EMT
    CAL F1230.W46 1971                                                  CI GE
   PRNT CS          ETC la,sc                                          MLOC
    EMI

    LOC STK              620S1.2
    BDY 1
   INST C            VAR

    LOC IAH              620S1.3
    BDY 2
   INST C            VAR

    LOC
    BDX

    LOC
    BDX
```

41

Figure 29. Cataloging on the Holdings Input (HH2) Format

cataloged. The next line allows for the input of the copy number/volume designation (BDY). The copy number must be input by the user; however, if several volumes or parts of sets were ordered, the volume designation portion of BDY would be prompted on the format. On the next line is an instruction field (INST). The system-prompted "C" in this field means that BALLOTS programs will catalog this particular item. If one of the items on the format were not to be cataloged, the user would delete the "C" value in the INST field and leave the field blank. The system would then skip over this item. Following the INST field is the variant imprint input field (VAR). Here the user could input variant imprint information for an item that was found not to have the same imprint given in the bibliographic record. For example, if one of several copies of a book were a British edition, and the remaining copies were American editions that matched the imprint information in the bibliographic record, then the British imprint would be input into VAR for the item at variance with the record.

When the holdings input (HH2) format has been completed, it is sent to the computer. Acceptance of it by the system is signified by the appearance of the message "ENTRY PROCESSED - ID = <number> -PDQ = <number>" on the general system (GS1) format. The GS1 format is the default format to begin the next cataloging operation.

Cataloging by other units within the Catalog Department, utilizing bibliographic descriptions taken from other LC sources (SST = 2) or from NUC contributed copy (SST = 4), would be conducted in much the same manner as the procedure just described. The bibliographic descriptions would be carefully compared with both the established entries in the Stanford catalog and Stanford cataloging conventions. Modifications to the bibliographic description of an item would be performed on the BI1 and BI2 input formats. Establishing the Stanford call number, assigning shelving location and copy numbers, inputting variant imprint information, calling for the creation of catalog cards, and so on would again be performed on the HH2 input format.

If a BMRC file record were now available for a BIPF entry that had been created without the aid of MARC data, the bibliographic description for the item in the BIPF could be entirely supplanted by the new BMRC record through the use of the "transfer" command. By using this command in the catalog function, the cataloger need not laboriously modify an entry to make it conform to standards. The transfer command replaces the old bibliographic description present in the BIPF with a more reliable BMRC entry. After making the transfer, the cataloger may modify the MARC-supplied data in the BIPF, using the BI1 and BI2 input formats.

Some records (SST = 5) will require original cataloging by a professional librarian. These items are assigned in the distribution function to specific catalogers, who process them in the catalog function. All of the Stanford University Libraries catalogers have been trained in the operation of BALLOTS, and will have the option of either performing original cataloging on-line or establishing the

catalog record on catalog data slips and assigning it to an assistant for input into the BCDF.

Original cataloging is performed as follows:

1. If a BIPF entry exists, it may be modified or changed entirely on the BI1 and BI2 formats as it is cataloged. The SST code is upgraded to SST = 1.

2. If no BIPF record exists for the item (i.e., the book is a gift or exchange for which no BALLOTS record was input), it is searched one last time against the BMRC file. If bibliographic copy is found in the BMRC file, it may be processed as described above. If no bibliographic copy is located, the user issues the command "create", and blank BI1 and BI2 formats are prompted for input. The operator then inputs the data into the proper fields, and if the data has been input correctly and passes the edits, the holdings input (HH2) format is prompted. The holdings information for the bibliographic description is input in the LOC and BDX data element pairs that appear at the bottom of the HH2 format. The user keys in the shelving location and the copy number/volume designations. The copy number information may be a range of copy numbers. The system will assign unique I.D. numbers to these books, and a new BCDF record will be created.

When processing added copies to an already cataloged title, the user cannot use the BI1 or BI2 format to update or alter the established bibliographic information. If the bibliographic record must be altered for an already cataloged item, this must be done in the maintenance function (see below).

As a result of the cataloging activity, sets of catalog cards, spine labels, and requester notices are produced overnight by batch programs. The computerized records of all the catalog cards to be produced are collected and sorted in proper filing sequence for individual catalogs (the Main Catalog, the Official Shelf List, departmental catalogs, etc.) by the system before the cards are actually printed. Figures 30, 31, and 32 are samples of a main entry catalog card, a shelf list catalog card, and spine labels.

The Reference Function

The reference function allows the user to enter a cross-reference or explanatory/history reference into the BREF file. The user does the checking of manual and computerized files necessary to determine the reference needs for an entry. When the requirements of the reference entry have been established, the user issues the "create" command in the reference function. In response to this command, the system prompts the user with a blank reference input (RI1) input format (see Figure 33). The user may input one of three kinds of references: (1) a "see" reference, (2) a "see also" reference, or (3) an explanatory/history reference. The last reference allows for the

F1230.W46 1971
Stack

White, Jon Ewbank Manchip
Cortes and the downfall of the Aztec empire; a study in a conflict of cultures, by Jon Manchip White. New York, St. Martin's Press [1971]
352p. illus., maps, plans, ports. 25cm.

Bibliography: p. [335]-339.

1.Mexico - History - Conquest, 1519-1540. 2. Cortez, Hernando, 1485-1547. I.TITLE. LA SC

620

Figure 30. Main Entry Catalog Card

F1230.W46 1971
IAH: c.2
STK: c.1

White, Jon Ewbank Manchip
Cortes and the downfall of the Aztec empire; a study in a conflict of cultures, by Jon Manchip White. New York, St. Martin's Press [1971]
352p. illus., maps, plans, ports. 25cm.

Bibliography: p. [335]-339.

OSL GE 620

Figure 31. Shelf List Catalog Card

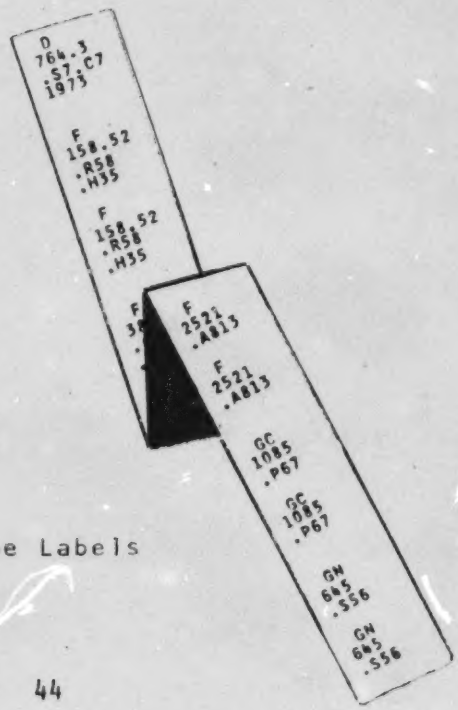


Figure 32. Spine Labels

creation of any explanatory or history text. These explanatory/history references may contain a number of cross-references.

In Figure 34, the operator has input data into the following fields on the RI1 format: INST--an instruction code to indicate that reference cards are required; RREC--a reference record type code to indicate which of the three kinds of references will be input (SE equals a "see" reference); RLOC--the catalog locations for which cards will be printed (in this case cards will be printed for the "MAIN" and "IAH"--Institute of American History--catalogs); SRCE--a note that indicates the source of the reference information (in this case the source is an LC book catalog entry); RFPN--the entry (in this case a personal name) to be referred from; and RTPN--the entry to be referred to. In Figure 34, the RFT field is left blank, but may be used for a Referred From Title Entry. The RT- mnemonics (Referred To Entry; in our example, the RTPN is such a mnemonic) do not appear on the blank prompted RI1 format, but are keyed in preceding the value of the data element.

When the RI1 format is accepted by the system, a reference record is created and is assigned a unique I.D. number and a PDQ number. Overnight, (see "THE BALLOTS FILES AND INDEXES" above) the indexes for the record are created and the designated reference cards are printed. Figure 35 shows the three kinds of reference cards possible.

The reference just created in Figure 34 could be accessed in the BREF file and displayed on a a full reference display (RF1) format as shown in Figure 36. All of the information contained in the BREF record (except RREC--reference record type) is displayed on the RF1 display format.

If the record required modification or updating, the RI1 format would be requested. (Note that the "create" command is used only to enter new records; records requiring modification are accessed by calling for the RI1 input format.) To modify a BREF record, the user would type over the fields requiring change, and would then enter the record. New catalog reference cards may be requested for modified reference records.

The Catalog Maintenance Function

The catalog maintenance function provides for the alteration of bibliographic and holdings data in the Catalog Data File (BCDF). Work under the maintenance function is limited to a special computer account and to authorized personnel. Discards, transfers, reclassifications, and corrections of catalog errors are recorded in the maintenance function.

To alter the bibliographic data, the user locates the record, usually by the I.D. number, and asks for the bibliographic input (BI1 and BI2) formats. To alter either the call number or the holdings data

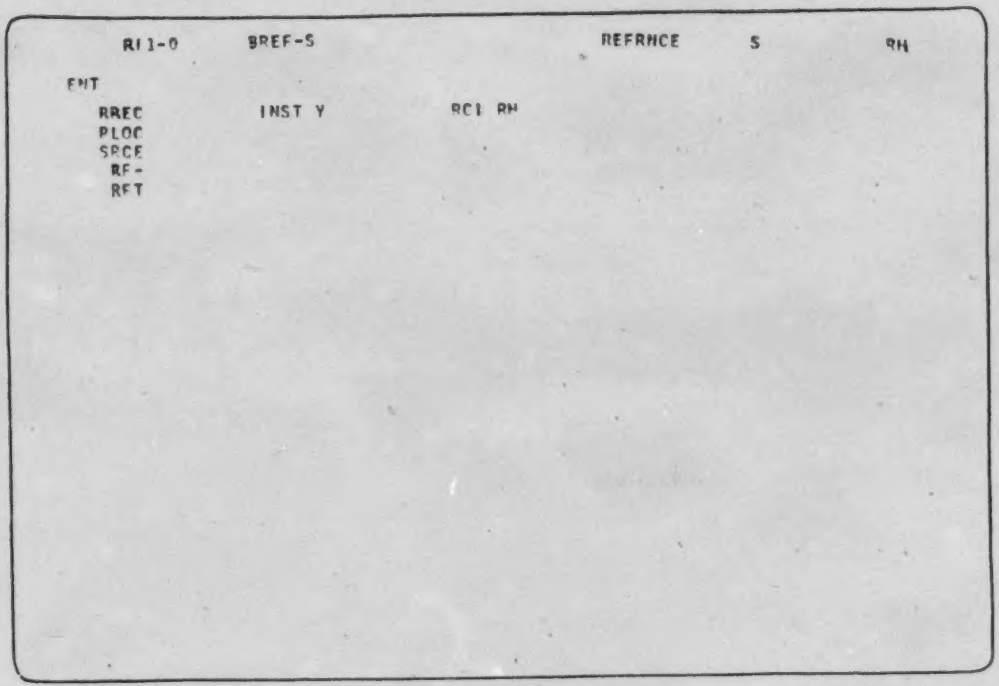


Figure 33. Blank Reference Input Format

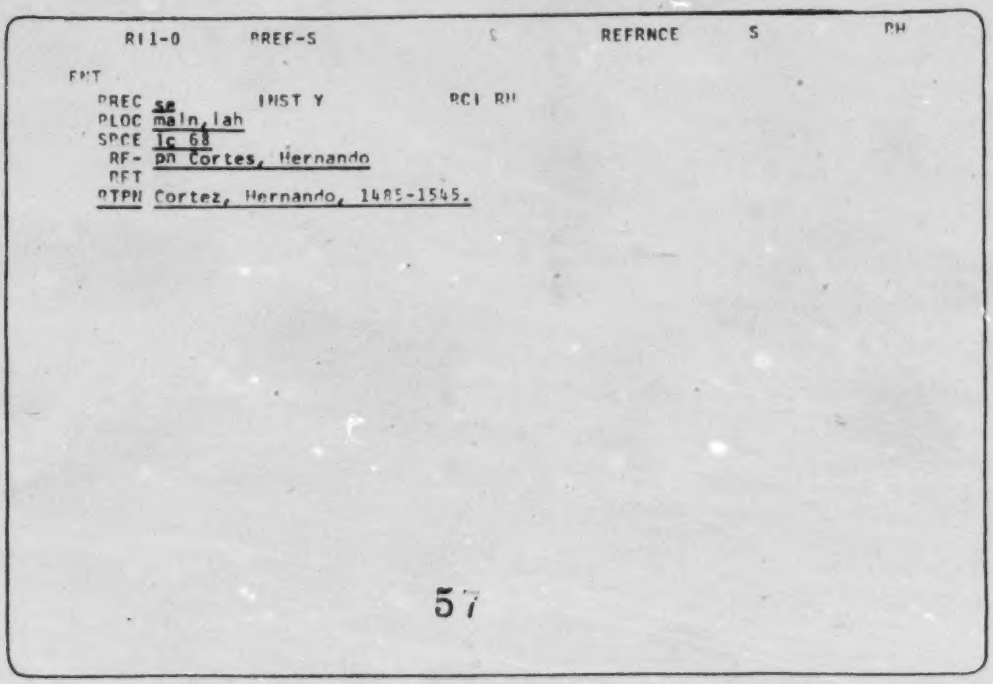


Figure 34. Filled-in RII Format

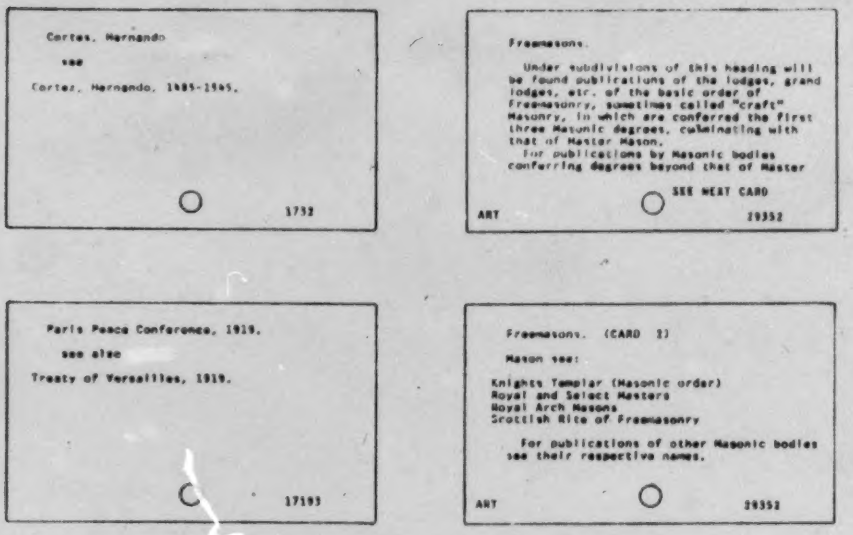

Cortes, Hernando
see
Cortez, Hernando, 1485-1545.
1732
Freemasons.
Under subdivisions of this heading will be found publications of the lodges, grand lodges, etc. of the basic order of Freemasonry, sometimes called "craft" Masonry, in which are conferred the first three Masonic degrees, culminating with that of Master Mason.
For publications by Masonic bodies conferring degrees beyond that of Master
SEE NEXT CARD
ART
29352
Paris Peace Conference, 1919.
see also
Treaty of Versailles, 1919.
17193
Freemasons. (CARD 1)
Mason see:
Knights Templar (Masonic order)
Royal and Select Masters
Royal Arch Masons
Scottish Rite of Freemasonry
For publications of other Masonic bodies see their respective names.
ART
29352

Figure 35. Reference Catalog Cards

```
     RF1        PREF-S     655                  REFRNCE      S          RH
FIN 655 -RESULT:      1 BOOK IN PREF

RC1  RH     RLOC MAIN,IAH
SRCE 1c 68

     Cortes, Hernando

       see

   Cortez, Hernando, 1485-1545.
```

58

Figure 36. Full Reference Display Format

the user asks for the holdings update (HU1) format. The HU1 format can be used only in this function.

In Figure 37, the user has reclassed the book by changing the call number. In addition, the user has noted in the INST (instruction) field that the first of the two items is missing. The code input to indicate this change in circulation status is "M". The second item, which had been shelved in a departmental library, has now been relocated to another shelving location. To indicate this, the user has input a new location value into the LOC field for the second item.

No printed outputs are produced as a result of actions taken in the maintenance function. However, replacement catalog cards can be generated in the cataloging function using the HH2 format.

The Scratch Function

The standing search request capability of the PO/OC module is a convenience to the library. In a search of the BMRC file, a staff member may not find a title that he believes eventually will appear there (because it is in the scope of MARC). In such a case, the user can request (by issuing a "keep" command) that the system retain the search request and match it against all incoming MARC records during each weekly update. If a match is found, the user will be notified on a special standing search request ("SSR") notice and the BSSR file entry will be automatically removed. Ninety-five percent of all the matches of BSSR records against BMRC records are correct the first time. Unsuccessful standing search requests are purged automatically after a specified period of time. Standing searches can be input in the order and catalog functions, but they can be removed only in the scratch function. The sole purpose of the scratch function is to allow the user to remove standing searches. In this function, the user issues the command "remove" followed by the BSSR I.D. number to remove a standing search request.

* * *

With a description of the maintenance function, we have completed a book processing cycle under the Purchase Order and Original Cataloging module. If one examined the final BCDF file entry for Jon Manchip White's book, it would look like Figure 38.

HARDWARE CONFIGURATION

The BALLOTS CRT terminals are located in the Stanford Main Library--see Figure 39--in the Acquisition and Catalog departments. These terminals are connected via twisted pair cables to a multidrop box (not shown) that acts as a shared data set, and then to a PDP-11 minicomputer in the academic computing branch of the Stanford Center for Information Processing (SCIP). The PDP-11 can handle approximately thirty or forty terminals. The PDP-11, in turn, is connected to an IBM

```
    HU1-0      RCDF-S     620                MAINT       S          GE

ENT
    CAL RH567.W46 1971                                        CI GE
    FMI                                                       MLOC STK

    LOC STK            620S1.2          CAT.10/16/73
    BDY 1
   INST M          VAR

    LOC STK            620S1.3          CAT.10/16/73
    BDY 2
   INST            VAR
```

Figure 37. Catalog Maintenance on the Holdings Update (HU1) Format

```
    PR1        RCDF-S     620                MAINT       S          GE
FIN 620 -RESULT:     1 BOOK IN RCDF

White, Jon Ewbank Manchip
  Cortes and the downfall of the Aztec empire; a study in a conflict of
cultures, by Jon Manchip White.  New York, St. Martin's Press [1971]
  352p.    $10.00   SST:35   MS:X   REC:AM      RCDM:IPF CDF
-------------------------------------------------------------------------------
S1       PRO PO                                    ADD 01
         ORD 04/08/73          PAC MKA006          SHE STK
         ACO MEy
         CAT Rush Cataloging Please
          VI AREL   RUSH, DO NOT SEND PAPERBACK EDITION
          RI EMG
     S1.1  CN0.05/08/73
     S1.4  CL1.05/08/73
-------------------------------------------------------------------------------
RH567.W46 1971
                                    1    STK          MIS.10/16/73     S1.2
                                    2    STK          CAT.10/16/73     S1.3
```

Figure 38. The Final Results on Processing, Displayed on the PR1 Format

49

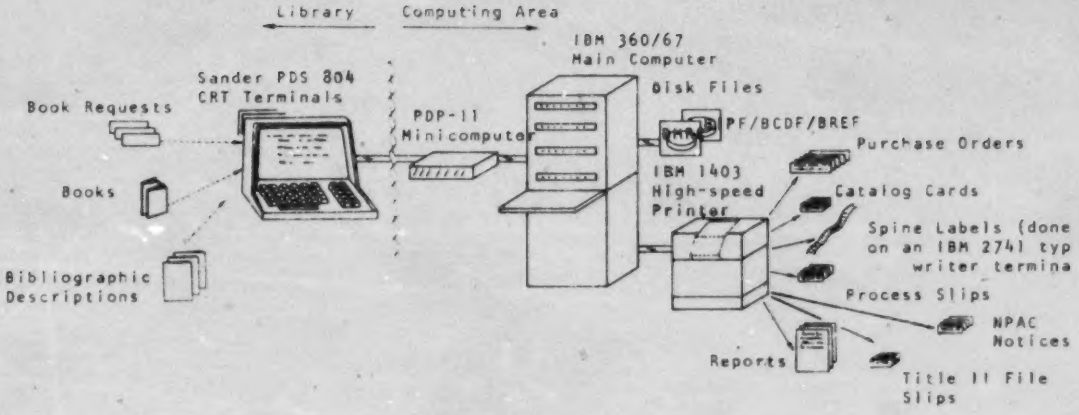


Figure 39. BALLOTS Hardware Configuration

2701 parallel data adapter (not shown), which is connected to a selector subchannel on the academic computing IBM 360 model 67 computer. The 360/67 runs the BALLOTS programs along with general time-shared and batch campus computing jobs. The BALLOTS files are stored on CDC 23142 double-density direct-access disk drives. The high-speed printer used for these jobs is an IBM 1403, capable of printing 1,100 lines per minute. All the regular and special forms for the library, except for spine labels, are printed on this high-speed printer. The spine labels are printed on an IBM 2741 typewriter terminal with a modified platen on which is mounted a SE-LIN Tape Label device. The spine labels are heat-sensitive with a plastic covering to protect the printed information. The characters are printed using a standard 2741 type ball.

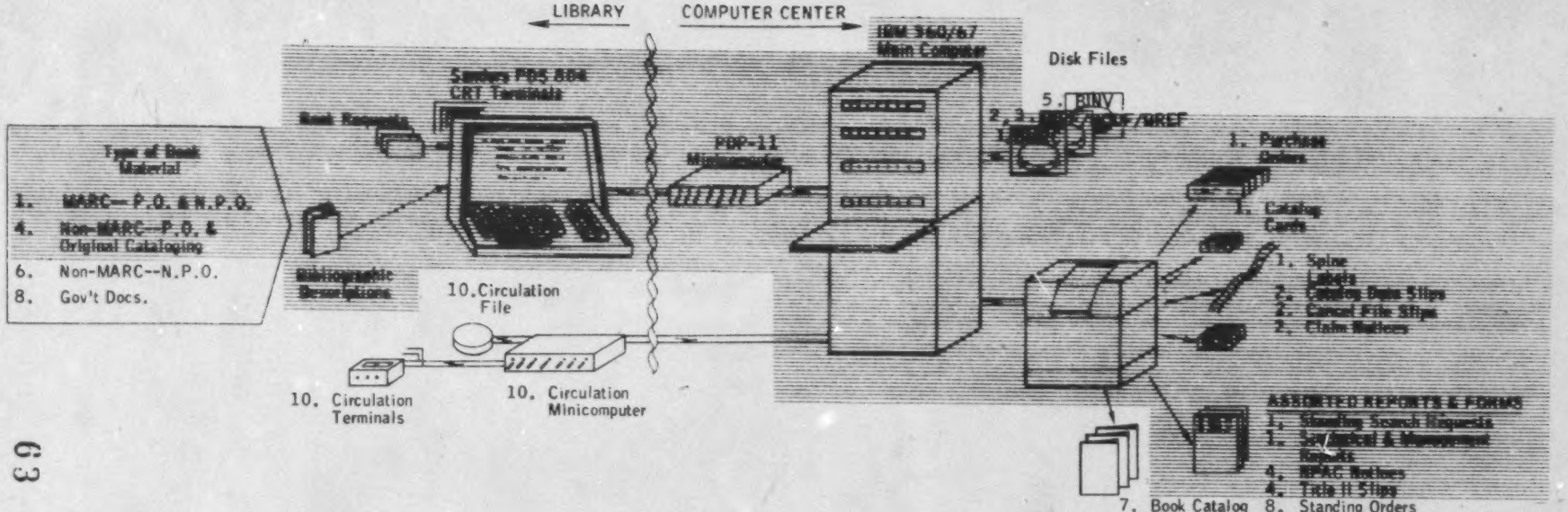
FULL SYSTEM SUMMARY

The full BALLOTS system is being implemented in a series of 11 "modules" or sets of services. Each module will add more services to the library, including new outputs, screen formats, and files. Everything that has been described so far is contained in the fourth module, called "Purchase Order and Original Cataloging". Figure 40 illustrates the major features of each module.

The shaded portions of the figure are the aspects of the full system that are incorporated in the PO/OC module. The MARC module features in Figure 40 are preceded by the number 1, to indicate that these were implemented in the first module; the IPF module features are preceded by a 2; CDF by 3; PO/OC by 4; etc. The printed outputs produced by each module are identified in the same way. These include purchase orders, catalog cards, spine labels, catalog data slips, requester notices, claim and cancellation notices, Cancel File slips, standing search requests, Title II File slips, NPAC notices, and certain statistical and management reports. The bottom half of Figure 40 itemizes the screen formats added to the system with each new module.

The 11 modules that make up the full BALLOTS system are described below in the order in which they are being implemented.

1. BALLOTS-MARC (implemented November 1972; capabilities incorporated and expanded in the succeeding modules). The library material processed by the MARC module is material appearing on weekly MARC tapes. (The restriction to English- or French-language monographic material is a consequence of the current scope of MARC). All roman alphabet languages can be supported by this module. The computerized file in this module is an on-line biblioqraphic data file of current MARC records (BMRC). The eventual size of the on-line file will depend on the requirements of the network libraries (see "CLAN" below) balanced against file storage costs. The file is read-only except for the addition of date codes for records used for ordering. Three functions (ordering, cataloging, and scratch) are supported by the BALLOTS-MARC module. Purchase orders, process file slips for



MODULE	FORMATS ADDED	MODULE	FORMATS ADDED
1. BALLOTS-MARC (BMRC)	Full Bibliographic Display (BF1) Biblio. Input (BI1, BI2) General System Format (GS1) Holdings Input (Output Request) (HH2) Order Input (OR1) Search Inquiry (SI1, SI2)	5. Inventory File (BINV)	Meyer Display Meyer Reference Meyer Input
2. In Process File (BIPF)	Full Acquisition Display (AF1) Holdings Update (HU1) Acquisition Matrix (single item vs. status) (RX1) Partial Acquisition Record Display (PR1)	6. Non-Purchase Order Material	---
3. Catalog Data File (BCDF)	Reference Display (RF1) Reference Input (RI1)	7. Book Catalog	---
4. Purchase Order and Original Cataloging	Partial Bibliographic/Full Holdings Display (OH1) Full Holdings Display (HF1)	8. Standing Order and Out-of-Print Desiderata	---
		9. Automatic Claiming and Canceling	---
		10. Circulation	Circulation Display Circulation Input
		11. Reserve Processing	Reserve Processing Display

Figure 40. BALLOTS System, Features by Module

technical processing files, catalog card sets, and spine labels are produced for any titles in the BMRC file on request. Automatic weekly searches to match user requests with new additions to the file are available through the standing search feature. In this first module no permanent on-line records were maintained during technical processing other than the full MARC record. Such on-line record keeping began with module 2.

2. In Process File (IPF) (implemented April 1973; capabilities incorporated and expanded in the succeeding modules). This module added an In Process File (BIPF) and additional printed outputs. Three additional functions (receiving, claiming/canceling, and catalog maintenance) are supported by the IPF module. Only MARC material is handled (until module 4). When a record is found in the BMRC file, it is transferred to the BIPF and is retained there as an updateable record throughout technical processing. A record in the BIPF can be reused if additional copies of a book are ordered. The first two modules supported approximately 15 percent of Stanford's ordering activity and 16 to 17 percent of its new title cataloging.

3. Catalog Data File (CDF) (implemented July 1973; capabilities incorporated and expanded in the succeeding module). This module added the on-line Catalog Data File (BCDF). From the implementation of module 2, BALLOTS saved bibliographic information, and this data was used to create the BCDF. All catalog records (except those for the Meyer Undergraduate Library--see module 5) enter the BCDF when they are no longer required in the BIPF. As the BCDF grows, it will become an increasingly valuable reference tool for both the technical processing and user service areas of the library. A seventh function (reference) and another file (BREF) as well as a Stanford call number index and a subject index were added to the system in the CDF module.

4. Purchase Order and Original Cataloging (PO/OC) (implemented October 1973). With this module, the use of the BIPF and BCDF was expanded considerably. The scope of material for which a record is created was broadened. Added were all non-MARC roman alphabet materials. Thus, if a record is not found in the BMRC file, an original BIPF or BCDF record is created at the terminal. Also, Title II File slips and National Program for Acquisition and Cataloging (NPAC) notices are produced under module 4. At this stage, BALLOTS supports approximately 90 percent of ordering and 81 percent of new title cataloging.

5. Inventory File (INV). Machine-readable bibliographic and holdings records already exist for all books in the Meyer Undergraduate Library. In this module, these records will be used to build an on-line Meyer Inventory file (BINV). At this point, the Meyer Cataloging Group will utilize the on-line file. This file will be used later on for reference and for the patrons' access to the complete holdings of the Undergraduate Library.

6. Non-Purchase Order Material. The scope of material added to the BIPF will be expanded to include non-MARC non-purchase order

material--gift, exchange, approval, and blanket orders. Modules 1 through 6 will process a total of 88 percent of total acquisition activity (purchase Order plus non-purchase-order materials) and 81 percent of cataloging. Module 6 and module 9 will both be implemented as one module, 6.

7. Book Catalog. This module will allow the Meyer Book Catalog to be produced directly from the BINV file rather than from the punched card process currently used.

8. Standing Order and Out-of-Print Desiderata. The capability of establishing standing orders (SO) and receiving the non-serial materials arriving with SO's will be added with this module. In addition, out-of-print items (OP) will be added to the BIPF, and search-and-quote letters produced for OP dealers. If an OP item is available, it can be ordered using the record already in the BIPF.

9. Automatic Claiming and Canceling. This module will add programs to review BIPF records automatically to determine if ordered material is overdue. Material may be claimed several times and finally canceled if the dealer does not respond. The Acquisition Department may override a scheduled claim or a cancellation. The department may also initiate an unscheduled claim or cancellation. With the completion of this module, BALLOTS will support 90 percent of total acquisition activity and 94 percent of new title cataloging.

10. Circulation. This module is designed to handle the complexities of the academic library circulation system. Using data from the Inventory file, a Meyer Library self-service circulation system will be implemented including charging, discharging, initial check-in, circulation searching, recall, holds, and overdue processing.

11. Reserve Processing. This module will add undergraduate reserve book ordering and processing. It will be added to the services already offered to Meyer staff through the use of the BMRC file, the BIPF, and the BINV file.

Although modules 5, 7, 10, and 11 will be implemented first at Stanford's J. Henry Meyer Memorial Undergraduate Library, each module will be generalizeable and its application not limited to Meyer Library.

CLAN (CALIFORNIA LIBRARY AUTOMATION NETWORK)

The features of the BALLOTS system have been kept as generalized as possible, so that the system could be adopted by other libraries for their use. The implementation of the "California Library Automation Network" (CLAN), a group of libraries in the San Francisco Bay area prepared to use parts of the BALLOTS system, is being actively pursued. With adequate funding, BALLOTS may be serving other academic and public libraries within two years.

CONCLUSION

The BALLOTS system design includes several features unique among the major on-line library automation systems, such as the Ohio College Library Center (OCLC) and the Experimental Library Management System (ELMS) of IBM. The most notable of these features are the programmable CRT terminal that aids the user in input and display; the protocol structure and the command language associated with it; the standard screen formats; the fact that an entire screen full of data is entered and processed at one time, rather that just one data element; and the flexible interactive searching capability. The method of searching used in BALLOTS was developed by a sister project, SPIRES (Stanford Public Information REtrieval System), whose connection with BALLOTS is outlined in several of the reports listed under "ADDITIONAL REFERENCES."

The BALLOTS system is intended to provide a library tool operating in the library's daily production environment. The system was designed with the help of the library, and is being used by the library staff. No special terminal operators were hired. Throughout the designing of the system, continual efforts were made to create a system as convenient and useful as possible to the library staff. To date the BALLOTS system has encountered ready acceptance by its users in the library, who find the system easy to learn and use. One of the major advantages of the system is that with a minimum of clerical effort (the searching and keying done at the CRT terminal), the library can obtain for each title searched a purchase order, vendor invoice, first and second claim notices (or cancellation notices and a Cancel File slip), a catalog data slip, two spine labels, and an average of ten different catalog cards.

At a number of points in the system, smoothing the way for the user has meant increasing the complexity of the BALLOTS analysts' and programmers' tasks. This paper has made no attempt to describe the program structure underlying BALLOTS operations. Rather, it gives an overview of these operations as they are seen and participated in by the librarian or technical processing assistant.

ADDITIONAL REFERENCES

(The following publications relate to the initial planning and designing of BALLOTS, the development of the proposed network, and the evolution of the system from 1967 to 1973. All are available as indicated from the BALLOTS Documentation Office, Stanford Center for Information Processing, Stanford, California 94305.)

System Scope for Library Automation and Generalized Information Storage and Retrieval at Stanford University. Stanford, California, Stanford University Libraries, 1970. 157 pp. ($7.50.) A joint publication by the SPIRES and BALLOTS project staffs detailing the experience, goals, and methodology of the two projects.

Epstein, A. H., Douglas Ferguson, and Eleanor Montague. "An On-line Network--Cooperative Planning with Several Libraries." In Jeanne B. North, ed., ASIS: Proceedings of the American Society for Information Science, Volume 8. Westport, Connecticut, Greenwood Publishing Company, 1971, pp. 227-31. (Reprints available.) A description of the steps taken by five libraries in the San Francisco Bay area to determine the feasibility of a library network to use the BALLOTS system.

Montague, Eleanor. Summary of a Feasibility Study on the Participation of Four Colleges and Universities in a Stanford University Library Automation Network. Stanford, California, SPIRES/BALLOTS Project, 1971. 72 pp. ($6.50.) A summary of the work in the BALLOTS network feasibility study and of the study findings, together with a detailed discussion of the cost analysis methodology used.

Epstein, A. H., Douglas Ferguson, Eleanor Montague, John Schroeder, and Allen B. Veaner. Final Report, Project No. 7-1145, Grant No. OEG-1-7-071145-4428, Bibliographic Automation of Large Library Operations using a Time-sharing System: Phase I. Stanford, California, Stanford University Libraries, 1971. 101 pp. (without appendices). (LARC reprints available.) A progress report on the period of prototype system development and operation and on the first months of development of the production system. Covers the period from June 1967 through June 1970.

Epstein, A. H., Wayne Davison, Eleanor Montague, Madeleine Stovel, and Allen B. Veaner. Final Report, Project No. 7-1145, Grant No. OEG-0-70-2262, Bibliographic Automation of Large Library Operations using a Time-sharing System: Phase II, Part 1. Stanford, California, Stanford University Libraries, 1972. 206 pp. A progress report on system development--specifically on the detailed analysis and design involved in the system. Covers the period from July 1970 through June 1971.

First Annual Report of the BALLOTS Project to the National Endowment for the Humanities: September 1, 1972 - August 31, 1973. BALLOTS Project, Stanford Center for Information Processing, Stanford

University, Stanford, California, September 1973. 120 pp. Describes the initial operation and the continued development and implementation of the BALLOTS system over the first year of a two-year grant from N.E.H.

BALLOTS System Reference Manual. Stanford, California, Project BALLOTS, 1972. Approx. 340 pp. (Cost of reproduction.) A basic tool in the Library's use of the operational BALLOTS system. Describes the procedures in which the system is used, commands, CRT terminal screen formats, data elements, error codes, system messages, samples of outputs, computerized files, and terminal operation.

Epstein, A. H., Wayne Davison, and Allen B. Veaner. A User's View of BALLOTS, No. 1: The MARC Module. Stanford, California, Project BALLOTS, 1972. Rev. ed., 1973. 31 pp. Describes the uses in the Stanford Main Library of the first implemented BALLOTS services, and the general design of the system from the user's standpoint.

Logan, Timothy, Wayne Davison, and A. H. Epstein. A User's View of BALLOTS, No. 2: The IPF Module. Stanford, California, Project BALLOTS, 1973. 39 pp. Describes the use in the Stanford Main Library of the first two modules (sets of automated services). Presents the general design of the system from the user's standpoint.

Montague, Eleanor. A User's View of BALLOTS, No. 3: The CDF Module (A Supplement). Stanford, California, Project BALLOTS, 1973. 8 pp. Describes the alterations made to the operational system with the implementation of the third module.

Timothy Logan

Madeleine Stovel

A USER's VIEW OF BALLOTS

No. 5 (A Supplement to No. 4)

The ACC/NPO Modules

June 1974

Library Computing Services (BALLOTS Project)
Stanford Center for Information Processing
Stanford University
Stanford, California

A BRIEF SUMMARY OF THE CAPABILITIES ADDED TO BALLOTS II IN APRIL 1974

The sixth module (Non Purchase Order Material Receipt) and the ninth module (Automatic Claiming and Canceling) of BALLOTS II were combined and implemented simultaneously in April 1974. Library use of the previous modules was described in "A User's View of BALLOTS, No. 4: The PO/OC Module", by Glee Cady and Timothy Logan, published in December 1973. This supplement describes the salient features of the ACC/NPO modules. It is dependent on the User's View No. 4 to complete the picture of the operational system.

The major new feature of the Automatic Claiming and Canceling (ACC) module is that through it, claim and cancellation notices are generated automatically for outstanding orders. The claim period is determined by the searcher at the time of order, and input in the Claim Type (CLT) data element field on the Order Input (OR1) format under the Order function. (See the explanations of terminal screen formats and activity functions in User's View No. 4.) The claim period is expressed as a number of months. (Figure 1 is a schedule for automatic claims.) After this number of months has passed, if there has been no activity against the order (as shown in the In Process File record for that title), a first claim notice to the vendor is printed. The In Process File (BIPF) record is automatically updated to reflect this action. After the claim period has passed again, a second claim notice is printed, and the record is again updated. After a third period has passed, a cancellation notice and Cancel File slips are printed, and the order is purged from the BIPF.

For example, if a title were ordered on May 1, 1974, with a claim type of 3 (that is, to be claimed after three months), the first claim notice would be printed on August 1, 1974 (or rather on the first weekend following this, since the automatic claim program is run once a week over the weekend). The second claim notice would be printed on November 1, 1974, and the cancellation would take place on February 1, 1975.

The library staff may vary this automatic claim cycle through a variety of changes made to the BIPF on-line. They may change the date on which the claim or cancellation notice is to take place, pushing it forward or backward in time. They may reset the claim cycle so that the previous claim notice is produced again. (This is used to avoid an automatic cancellation of the order.) They may change the claim type if they wish to change the claim schedule, but this normally does not affect the date of the very next claim--it affects the date of the claim after that. Or they may, as was the standard procedure in the earlier modules, force a claim or a cancellation. In the ACC module, if a claim is forced, the next action after that will

SCHEDULE OF CLAIMS

CATEGORY	CLT CODE	CLAIM PERIOD
1. RUSH Books and Offers - American	2	60 days
2. In Print Books - U.S. and Canadian Vendors (current, within last two years)	3	90 days
3. In Print Books - U.S. and Canadian Vendors, non-current and non-commercial Form Selection (unless "to be published")	4	120 days
4. In Print Books, Western European Titles (current, within last two years) Offers - European	5	150 days
5. In Print Books, Western European Titles, non-current and non-commercial	6	180 days
6. In Print Books, foreign other than European	9	270 days
7. Out-of-Print Desiderata * Exchange Requests Reprints "to be published" Not yet published (no date)	12	360 days

Figure 1

This is the tentative schedule of claims devised by the Order Division of the Stanford University Libraries, April 1974. It will be modified as necessary as the library gains experience with BALLOTS automatic claiming. Such modifications will require no changes to BALLOTS programs.

* To be included in the Out of Print (PO) module.

take place when the already established claim period has elapsed, beginning from the date of the forced claim. Recording receipt of the material in the BIPF record stops the automatic claim cycle.

The major addition made to the BALLOTS system by the Non Purchase Order Material Receipt (NPO) module is the ability to process materials received on approval, blanket order, or university press blanket order, and through gifts and exchanges; and to enter records for cataloging arrears. (This processing is done only after the decision has been made to add the item in hand to the library collection.) By extending the system past the scope of purchase orders, the library is currently (as of May 1974) able to process approximately 80 percent of its acquisitions through BALLOTS. (During 1972/73, the Stanford University Libraries issued 24,000 purchase orders and processed 14,000 volumes of non-purchase-order material. This should give an idea of the volume of technical processing being discussed.)

To process non-purchase-order items, the item is first searched in the on-line files--the Reference File, the Catalog Data File, the In Process File, and the BALLOTS MARC File; if no record is found in any of these files, the searcher uses the "create" command to key in the bibliographic and acquisitions information necessary to create a new record. If a record is found in either the Catalog Data File (BCDF) or the In Process File (BIPF), the searcher keys acquisitions information into that record, using the Order Input (OR1) format under the new Non Purchase Order function. The item in hand is then sent to the Distribution or Added Copies Unit of the library, along with the catalog data slip that is produced for titles input under the NPO function.

An item for which a BMRC file record is found may be cataloged on-line in the Catalog function; or it may be input into the BIPF in the NPO function and passed along to the Distribution Unit for routing to the appropriate cataloging area.

In the latter case, the distribution of an item after a record has been input under the NPO function is determined by the value given to the SHE (Shelving Location) data element. The rules for routing non-purchase-order items are the same as those for routing items processed on the Acquisition Matrix (RX1) format under the Receipt function. However, in case the material must be sent to the Binding and Finishing Division before further processing is done (for example, if the item is to be bound before it is cataloged), a special Process Control Code (PCCD) instruction field is provided on the OR1 format; this field appears on the OR1 format only in the NPO function.

Standing searches may be input in the NPO function, and the material held pending the arrival of a MARC record.

Whenever information about an item is keyed under the NPO function, the Acquisition Control Code (ACCD) in that record is automatically set to "MRI" ("material received") and the order and receipt date are set to that day's date.

The NPO module provides an additional printed form, the Fund File slip. The user at the terminal requests this slip at the time he creates a record for the item, by keying the code "7" into the Special Notification Indicator (SNI) field on the OR1 format. A Fund File slip is then produced upon receipt of the item. The Fund File slip is used to record purchases made from restricted budget accounts and purchases for individual items that exceed ninety-nine dollars.

Also in the scope of the material handled by this module are form selection items. In this method of procurement, the dealer supplies typed slips to the library for titles that are available for ordering. The library returns the slips for the titles it wants to the dealer. The slip serves as a purchase order. A corresponding BIPF record is created in BALLOTS in the Order function, with a Procurement Type (PRO) of "FS". No computer-produced purchase order is printed for such an order, but it has the same status as other purchase orders, and is subject to automatic claiming as described above.

Eleanor Montague

A USER'S VIEW OF BALLOTS

No. 6 (A Supplement to Nos. 4 and 5)

The Standing Order (SO) Module

July 1974

Library Computing Services (BALLOTS Project)
Stanford Center for Information Processing
Stanford University
Stanford, California

A BRIEF SUMMARY OF THE CAPABILITIES ADDED TO BALLOTS II DURING JULY 1974

The seventh module (Standing Order) of BALLOTS II was implemented in July 1974. Library use of the previous modules is described in "A User's View of BALLOTS, No. 4: The PO/OC Module" and "A User's View of BALLOTS, No. 5 (A Supplement to No. 4): The ACC/NPO Modules."

Six major new features were added to the BALLOTS system by the Standing Order (SO) Module.

1. The library can establish standing (permanent until terminated) In Process File (BIPF) order records for titles with pieces arriving over a period of time (monograph series, terminal sets, and serials) ordered by the Order Division, the Serial Records Division, and the Government Documents Department.

2. The library can catalog serial and terminal set titles on-line. (A "terminal set" is a multivolume work that terminates when the planned contents have all been published.)

3. The library can catalog materials with any type of call number on-line.

4. The system will automatically claim a standing order for which no material was received in a period of time specified at the time of order.

5. The library can check in on-line the arriving terminal set and monograph standing order pieces processed by the Order Division.

6. At various points in technical processing, the library can remove (void) an item already entered in an In Process File or Catalog Data File record.

With this new ability to process standing orders, the library uses BALLOTS for over 90 percent of its acquisition activities. Only orders for non-romanized languages continue to be handled manually. With the capability of cataloging serial and terminal set titles and materials with any type of call number, the library also now uses BALLOTS for nearly 90 percent of new title cataloging.

1. Orders for monographic series, serials, and terminal sets are centrally processed by the Acquisition Department's Order Division using the Order (ORD) function of the automated system. If the title is found to be already on order or cataloged, only added copy acquisition information is keyed on the Order Input (OR1) video terminal screen format. If the title is not on order or cataloged, the searcher uses the "create"

command to key in both the bibliographic and acquisition information necessary to create a new record. (See the explanations of terminal screen formats and function activities in "User's View No. 4").

Standing orders are identified on the Order Input (OR1) format by any of six "Method of Procurement" (PRO) data element codes; these indicate (a) the library's decision on whether the title is to be cataloged as a serial or as separate pieces, (b) the department responsible for receiving and checking in incoming pieces, and (c) whether the pieces are checked in using the BALLOTS In Process File (BIPF) standing order record, or are recorded in manual files in the department. The PRO codes for standing orders are:

T = Terminal set; each arriving piece checked in by the Order Division using the BIPF record.

S = Serial; first piece checked in using the BIPF record; subsequent items checked in on manual records maintained in Serial Records Division or Government Documents Department.

NS = Numbered series cataloged as a serial; first piece checked in using the BIPF record; subsequent items checked in on manual records maintained in Serial Records Division or Government Documents Department.

SS = Numbered series, classed as separates; first piece checked in using the BIPF record; subsequent items checked in on manual records maintained in Serial Records Division or Government Documents Department.

SP = Unnumbered series, classed as separates; all items checked in by the Order Division using the BIPF standing order record.

UG = Government Documents Department standing order, classed as separates; first piece checked in using the BIPF record; subsequent items checked in on manual records maintained in Government Documents files.

Information in BALLOTS records is conceptualized as "structures" of various types of data. For example, a BIPF record contains permanent bibliographic information and temporary acquisition information. When the processing of the title or added copy is complete, the permanent bibliographic information (the CDF structure) is combined with Stanford holdings information (the holdings structure) in the BALLOTS Catalog Data File (BCDF); while the acquisition information (the IPF structure) is purged. With this module, a new concept within the acquisition information in the BALLOTS In Process File record is utilized: the "set" information structure. Standing orders imply

an order for a series or for a title that may consist of several volumes, which may arrive over a period of time. The set structure represents the order for the series or the multivolume title as a whole. This enables the Acquisition Department staff to cancel, claim, or complete the order for the series or title as a whole.

The set structure is created under the Order function when an order is input with PRO equal to one of the codes listed above. When PRO = T or SP (i.e., all incoming items will be checked into the BIPF), "item" structures are also created for the individual items specified in the order, so that these items can be received, claimed, or canceled individually. As for printed outputs from standing order input, in addition to purchase orders 3" x 5" order slips are produced for the Serial Records Division or Government Documents Department files for titles to be checked in manually (PRO = S, NS, SS, UG).

2. After separate pieces have been checked in using the BIPF standing order record (with PRO = SP), the Order Division creates a separate BIPF record for each item under the Non Purchase Order Material Receipt (NPO) function with PRO = SO (item received as part of a Standing Order) specified on the OR1 screen format. The Catalog Department uses these BIPF records to catalog the separate items, thus creating new records in the Catalog Data File (BCDF). For standing orders to be cataloged as serials, the single BIPF standing order record is used as the foundation for the BCDF record. This BIPF record remains in the file until the order is voided or completed. The Catalog Department sets up a separate BCDF record for serial and terminal set analytics. (From this separate record the system will print catalog cards for works or parts of works that are contained in a collection, series, an issue of a serial, or other bibliographical unit for which another, comprehensive catalog card is produced.)

In cataloging serials and terminal sets, a new data element is used to record the status of the title at each location where it is held and to control the printing of various messages concerning the set on the catalog cards. This data element is called MASH--"Messages and Status of Holdings".

3. Under the Standing Order module, all types of call numbers are supported. These include student reports, microtexts, phonodiscs, mystery collections, Dewey analytics, and brittle books.

All the required catalog cards and spine labels are automatically produced for new materials and for added copies and volumes cataloged through BALLOTS. In addition in this module, in the Catalog Maintenance (MAI) function, particular catalog cards or sets of cards may be specifically requested in the

"Print Instruction" (PRNT) data element field on the Holdings Update (HU1) screen format. This is a welcome feature of the new module, since in the past the staff had to request an entire new set of cards on the Holdings Input (HH2) screen format under the Catalog (CAT) function in order to obtain perhaps a few replacement cards.

4. The claim period for the set requested in a standing order is determined by the searcher at time of order and input in the "Claim Type" (CLT) data element field. The claim period is expressed as a number of months. The automatic claim cycle works from this information in the set structure and produces an automatic claim to the vendor if no material has been received in the period specified. Titles for which each piece is checked into the BIPF (PRO = T, SP) are subject to automatic claim until the Order Division updates the record to indicate that the set is complete. Other standing order titles are automatically claimed until the Order Division updates the record indicating that the first piece of the title has been received.

In addition, at any time, the Order Division may request an immediate claim or cancellation notice to be printed or may vary the automatic claim cycle by changing the date on which the next automatic claim notice is to be printed. (This is done using the "Instruction Code" (INST) field on the Acquisition Matrix (RX1) screen format.) The library staff may alter the Claim Type data element on the Order Input (OR1) format, but this does not affect the date of the very next claim--it affects the date of the second subsequent claim. For orders with PRO = T or SP, individual items specified at time of order may be force claimed, force canceled, voided, or received, but the automatic claiming cycle does not work from individual item structures within the set.

5. For terminal sets (PRO = T) and standing orders classed as separates (PRO = SP), all incoming items are checked into the BIPF record. Since the number of volumes may not be known at the time of order, new item structures may be created in the Receipt (REC) function on the Acquisition Matrix (RX1) screen format, using blank "Individual Material Description" (MDY) data element fields. For such items the Acquisition Control code (ACCD) in the record is automatically set to "MRI" ("Material Received") and the receipt date is set to that day's date. If the item being checked in has no volume or part number, etc., the item is described with the author's name and short title in the MDY data element. A catalog data slip is printed for these items to accompany them to the Catalog Department. (Again, see "User's View No. 4" for more about this and other processing slips.)

For standing orders with PRO = S, NS, SS, or UG, individual pieces are checked into the manual Serial Records or Government Documents files and not into the BIPF.

6. Finally, in the Standing Order module, items recorded in error in a BIPF or BCDF record may be removed by putting a "Y" in the "Instruction Code" (INST) field on the Acquisition Matrix (RX1) format in the Receipt and Claim functions; or on the Holdings Input (HH2) format in the Catalog and Distribution functions; or on the Holdings Update (HU1) format in the Catalog Maintenance function. A 3" x 5" Void Slip is produced whenever an item is voided. This capability allows the technical processing departments to maintain accurate records for items in process or held by the library. It could be used, for example, to remove an item inadvertently (and incorrectly) added by a system user.

Glee Harrah Cady

A USER'S VIEW OF BALLOTS

No. 7 (A Supplement to Nos. 4, 5, and 6)

The Out-of-Print (OP) Module

September 1974

Library Computing Services (BALLOTS Project)
Stanford Center for Information Processing
Stanford University
Stanford, California

A BRIEF SUMMARY OF CAPABILITIES ADDED TO BALLOTS II

IN SEPTEMBER 1974

The eighth module (the Out-of-Print module) of BALLOTS II was implemented in October 1974. Library use of the previous modules is described in "A User's View of BALLOTS, No. 4: the PO/OC Module" and the two supplements to No. 4 (Nos. 5 and 6) that described the ACC/NPO modules and the SO module. Like the two preceding it, this supplement cannot stand alone as a system description, but must be read in conjunction with User's View No. 4 and the other supplements. When the last module planned as part of BALLOTS II is implemented, a complete description of the entire system will be produced as the final publication in the "User's View" series.

Itemized, the major features added to BALLOTS in the OP module are:

1. The library may add out-of-print desiderata records to the In Process File (BIPF) in the ORDER function. Such desiderata records contain information about out-of-print items that the library wishes to acquire.

2. The library may add stop records to the BIPF in the ORDER function. Stop records contain information about items that the library has chosen not to acquire. (Stop records will only be input to record a decision not to acquire costly or rare material.)

3. The system produces search and quote notices for OP desiderata records when these records are added to the BIPF; these search and quote notices are sent to vendors.

4. The system automatically produces alert slips for OP desiderata and stop records when the Automatic Claim and Cancellation program is run. The alert slip, a new output, informs the Acquisition Department that a particular record remains in the file.

5. The system will automatically produce alert slips for OP desiderata and stop records if these records are eliminated from the BIPF, to notify the Acquition Department of the record deletions.

6. The library may update the data in an OP desideratum record to produce a purchase order in the ORDER function, once an acceptable response has been received to a search and quote notice. The desideratum record then becomes a typical order record in the BIPF.

7. The library may remove desiderata and stop records from the BIPF as well as reference records from the Reference File (BREF) by issuing the new ELIminate command.

8. The library may input additional item descriptions in the RECEIPT function for material not specifically known at time of order.

9. The library may update item descriptions in the RECEIPT function.

10. The library may reset an item erroneously received to order status.

11. The system will prompt a duplicate order input format in the ORDER function if the IMItate command is issued. The purpose of this is to save keying when another copy of an item is being ordered or when more search and quote notices are being requested.

* * *

With the OP module, when the library determines through manual searching that a desired item is out of print, it adds a desideratum record to the BIPF in the ORDER function. All the acquisition and bibliographic information that is available for the item is input at this time. The system produces search and quote notices overnight for mailing to vendors. The value of the Claim Type (CLT) data element determines when an alert slip will be produced by the Automatic Claim and Cancellation run. If an acceptable offer is received, the desideratum record is updated to order status in the ORDER function. After this, the processing of the record is continued in the manner described in User's Views Nos. 4, 5, and 6.

When the Acquisition Department determines that a costly and/or rare item offered by a vendor is not to be acquired, this decision may be recorded in the BIPF by adding a stop record to that file in the ORDER function. A claim type value is added to the acquisition part of the record so that the Automatic Claim and Cancellation run will produce an alert slip reminding the Acquisition Department that the stop record remains in the file.

Eliminating desiderata or stop records from the BIPF also stops the automatic alert cycle for these records.